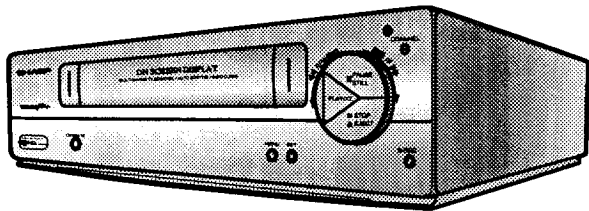


SHARP SERVICE MANUAL

S2615VCM202HM

VHS VIDEO CASSETTE RECORDER



(SUPPLEMENT)

MODEL VC-M202HM

CONTENTS

REPLACEMENT PARTS LIST 1
PACKING OF THE SET 2

This service manual covers only those items that differ from the VC-M21HM. For further information on items not covered by this supplement refer to the Service Manual for VC-M21HM.

REPLACEMENT PARTS LIST
PARTS REPLACEMENT

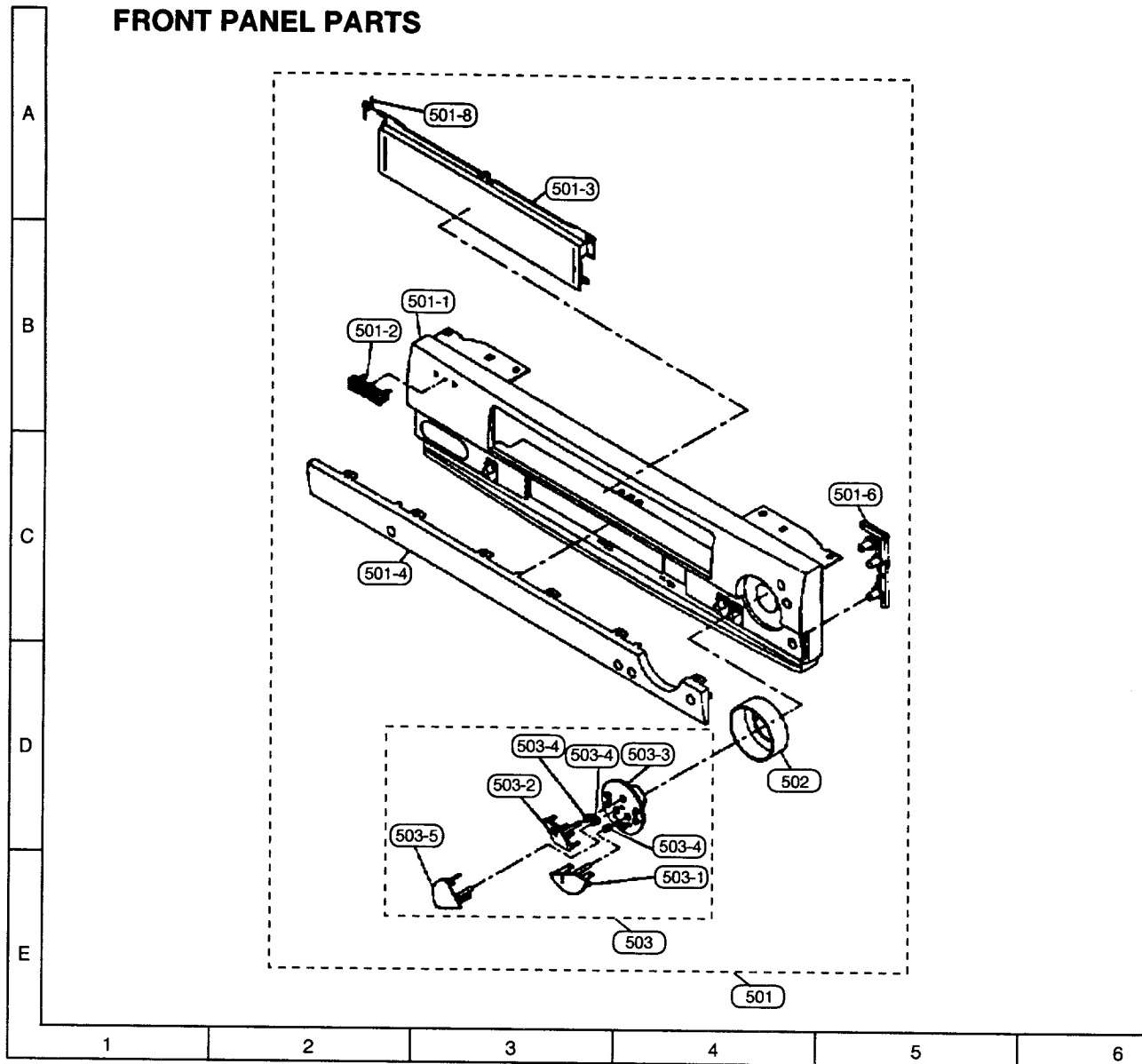
"HOW TO ORDER REPLACEMENT PARTS"
To have your order filled promptly and correctly,
please furnish the following information.

1. MODEL NUMBER
2. REF. NO.
3. PART NO.
4. DESCRIPTION
5. PRICE CODE

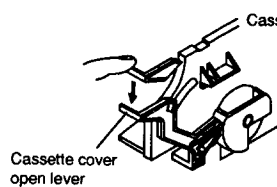
Ref No.	Part No.	*	Description	Code
OTHER PARTS				
-	TINS-2692UMSA	U	Operation Manual	AE

Ref No.	Part No.	*	Description	Code
FRONT PANEL PARTS				
501	CPNLC2061TEV0	U	Front panel assy.	AY
501-1	HPNLC2061UMSA	U	Front panel	AU
501-3	HDECQ1380UMSA	U	Cassette Flap	AF
501-4	HDECQ1428UMSA	U	Dec Window	AF
501-6	JBTN-2646UMSA	U	CH/Rec Button	AC

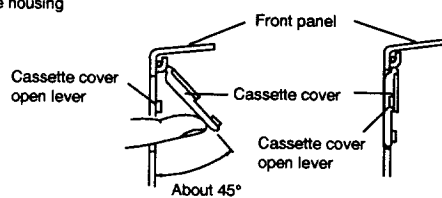
FRONT PANEL PARTS



PRECAUTION ON FRONT PANEL SET-UP

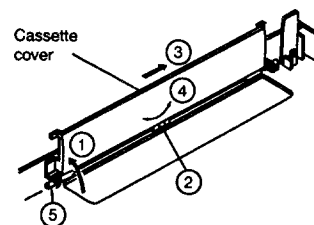


Before attaching the front panel in position, make sure that the cassette cover open lever is in its right place (lower-most). If it is out of position, push it down with a finger.



Keep the cassette cover about 45° open and make sure that the cassette cover open lever is between the front panel and the cassette cover. Now fix the front panel in place.

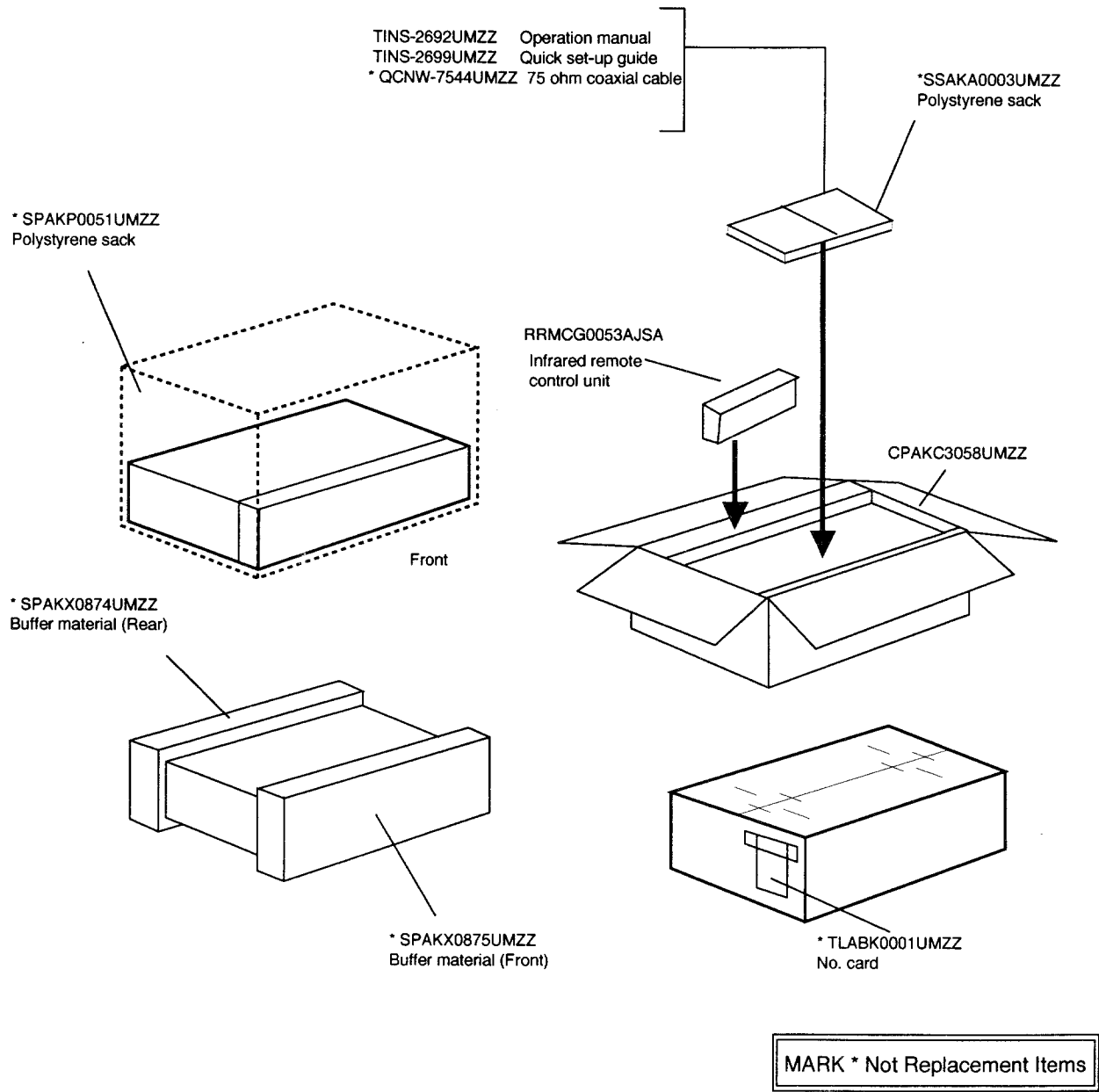
Do not mount the front panel with the cassette cover tilted too open. Otherwise the cassette cover might wrongly run on the cassette housing.



Removing the cassette compartment cover.

- 1 Open the cassette compartment cover fully.
- 2 Remove the center positioner.
- 3 Slide the cover to the right.
- 4 Slightly bend the cover.
- 5 Draw out the left-side rod.

PACKING OF THE SET



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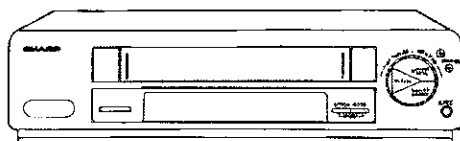
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VC-M21HM
VC-M41HM

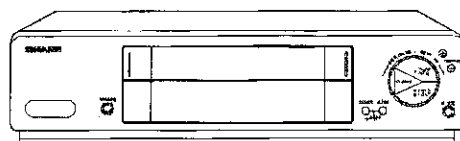
SHARP SERVICE MANUAL

S65R3VC-M21HM

VHS VIDEO CASSETTE RECORDER



VC-M21HM



VC-M41HM

MODELS VC-M21HM VC-M41HM

CEG TECHNICAL

**THIS COPY MUST NOT BE
REMOVED FROM CEG OFFICE**

In the interests of user-safety (Required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified should be used.

CONTENTS

	Page
1. SPECIFICATIONS	3
2. DISASSEMBLY AND REASSEMBLY	6
3. FUNCTION OF MAJOR MECHANICAL PARTS	9
4. ADJUSTMENT, REPLACEMENT AND ASSEMBLY OF MECHANICAL UNITS ...	11
5. ELECTRICAL ADJUSTMENT	35
6. MECHANISM OPERATION FLOW CHART AND TROUBLESHOOTING GUIDE	42
7. TROUBLESHOOTING	48
8. BLOCK DIAGRAMS	63
9. CIRCUIT DIAGRAM AND PWB FOIL PATTERN	71
10. REPLACEMENT PARTS LIST	85
11. EXPLODED VIEWS	97
12. PACKING OF THE SET	102

SHARP CORPORATION

PRECAUTIONS IN PART REPLACEMENT

When servicing the unit with power on, be careful to the section marked white all over.

This is the primary power circuit which is live.

When checking the soldering side in the tape travel mode, make sure first that the tape has been loaded and then turn over the PWB with due care to the primary power circuit.

Make readjustment, if needed after replacement of part, with the mechanism and its PWB in position in the main frame.

(1) Start and end sensors: Q851 and Q852

Insert the sensor's projection deep into the upper hole of the holder (LHLDZ1893AJ00). Referring to the PWB, fix the sensors tight enough.

(2) Photocoupler RH-FX0005GEZZ: IC901

Refer to the symbol on the PWB and the anode marking of the part.

(3) Cam switches A and B (RH-PX0231GEZZ or RH-PX0238GEZZ): D852 and D853

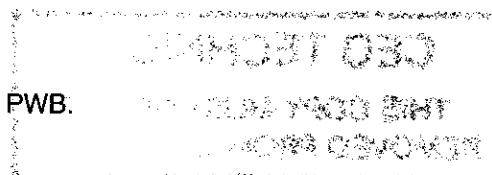
Adjust the notch of the part to the white marker of the symbol on the PWB. Do not allow any looseness.

(4) Take-up and supply sensors (RH-PX0232GEZZ): D855 and D854

Be careful not to confuse the setting direction of the parts in reference to the symbols on the PWB. Do not allow any looseness.

(5) Diode bridge (RH-DX0083GEZZ): D901

Adjust the + marking of the part to the symbol's cathode marking on the PWB.



1. SPECIFICATIONS

Format:	VHS PAL standard
Video recording system:	Two rotary heads, helical scan system
Video signal:	PAL colour and B/G signals, 625 lines
Recording/playing time:	240 min max. with SHARP E-240 tape (SP) 480 min max. with SHARP E-240 tape (LP)
Tape width:	12.7mm
Tape speed:	23.39 mm/s (SP) 11.70 mm/s (LP)
Antenna:	75 ohm unbalanced
Receiving channel:	UHF Channel E21-E69
RF converter output signal:	UHF Channel E30-E39 (preset to CH E36)
Power requirement:	AC230V-240V, 50Hz
Power consumption:	Approx. 16 W
Operating temperature:	5°C to 40°C
Storage temperature:	-20°C to 60°C
Weight:	Approx. 3.6 kg
Dimensions:	380 mm (W) x 290.3 mm (D) x 91.8 mm (H)
VIDEO	
Input:	1.0 Vp-p, 75 ohm
Output:	1.0 Vp-p, 75 ohm
S/N ratio:	45 dB
Horizontal resolution:	250 lines
AUDIO	
	0 dBs = 0.775 Vrms
Input:	Line: -3.8 dB, 47k ohm
Output:	Line: -3.8 dB, 1k ohm
S/N ratio:	42 dB
Frequency response:	80 Hz ~ 10 kHz
Accessories included:	75 ohm coaxial cable Operation manual Infrared remote control Battery (2pcs.)

As part of our policy of continuous improvement, we reserve the right to alter design and specifications without notice.

Note: The antenna must correspond to the new standard DIN 45325 (IEC 169 - 2) for combined UHF/VHF antenna with 75 ohm connector.

BEFORE RETURNING THE VIDEO CASSETTE RECORDER

In addition to the checks necessary as a result of a repair having been carried out, the following additional safety checks should also be made before returning the unit to the user.

1. Inspect all lead dress to make certain that leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the Video cassette recorder.
2. Inspect all protective devices such as non-metallic control knobs, insulating fishpapers, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacitor networks, mechanical insulators etc.
3. Apply test voltage of 3000 volts between live parts and accessible metal parts for 3 seconds.

PRECAUTIONS IN SERVICING THE MS2 PAL SYSTEM MODELS

1. Mounting the PWBs

The basic set-up procedure for these models is the same as for the MS1 models (1994 models). Refer to the VC-A49GM handbook, for example.

(1) Hand-inserted parts

Make sure that the tuner, RCA jack, 21-pin socket, plug socket, remote control receiver, shielding case, switches, mechanism sensors and other hand-inserted parts are tight in position.

① The general safety instructions are issued by Safety Group. Follow the "Safety Precautions". Be also sure that the primary-power capacitors C905, C906 and C915 (parts depending on models) are tight enough in place.

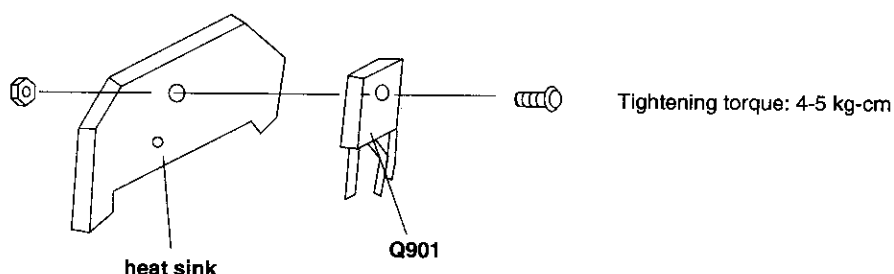
② Transformer and switching transistor

(Only for models: VC-MA31, MA221, MA441, MA51, MH83, VR136, MH93, MA63)

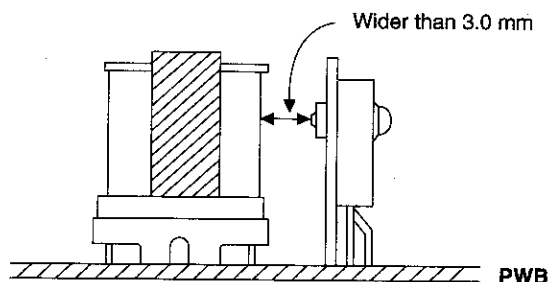
The following instructions apply to the above models.

Mounting the transistor Q901 on the PWB

[Preparatory step] Fix Q901 on the heat sink.



Install the above transistor/heat sink assembly on the PWB. Make sure that there is a clearance of over 3.0 mm between the Q901 fixing screw and the transformer T901.

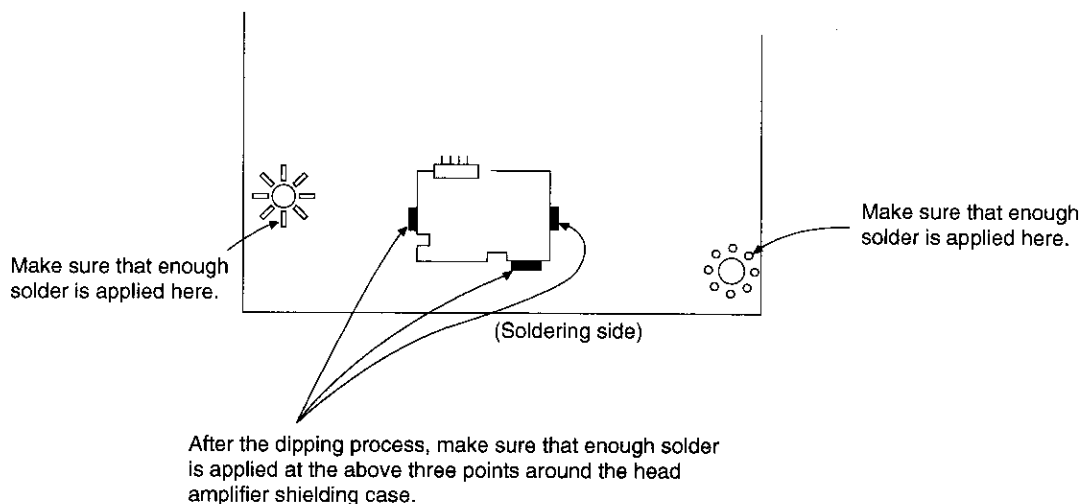


③ Handle the sensors and switches (start sensor, end sensor, cam switch, reel sensor, and record tip sensor) with care.

* The preparatory step for the start and end sensors is the same as for the MS1 models.

(2) Soldered parts

- ① The board-to-board connector "AO", RCA jack and some other parts are soldered in position.



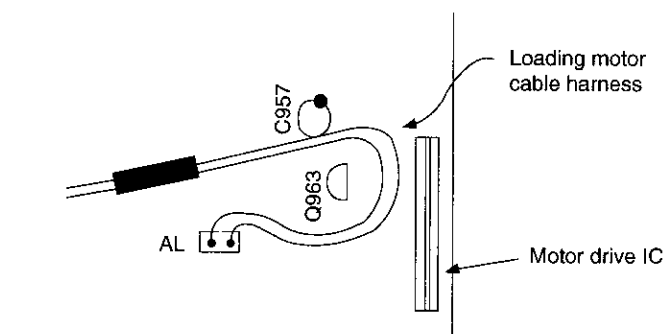
(3) Coaxial cables (QCNW-0182AJZZ)

- ① Models for: VC-A37X, VC-A37NZ, VC-A631X, VC-MA31, VR-136, VC-MA221, VC-MA441, VC-MA51
Connect the cable's straight end to the tuner and the L-shaped end to the converter.
- ② Models for: VC-M20GM, VC-M201GM, VC-M19SM, VC-M20HM, VC-M40SM, VC-M401SM, VC-M200BM, VC-M400BM
Connect the cable's L-shaped end to the tuner and the straight end to the converter.

2. Assembling the chassis

(1) Dressing the cables

- ① Be careful not to connect the flexible flat cables upside down. Their sockets are in special shape.
- ② Install the harnesses with care not to get caught by the frame and the mechanism (cassette controller).
- ③ Make sure that all the harnesses are tight in position.
- ④ Shape the loading motor cable harness as shown below.



(2) Mounting the mechanism

- * Set up the mechanism with care to the sensors and the record tip switch. Keep the sensors free of dust, grease, etc.
- * Install the capstan motor with correct connections between the circuit boards.

(3) Tightening the screws

Follow the instructions from Mechanism Group.

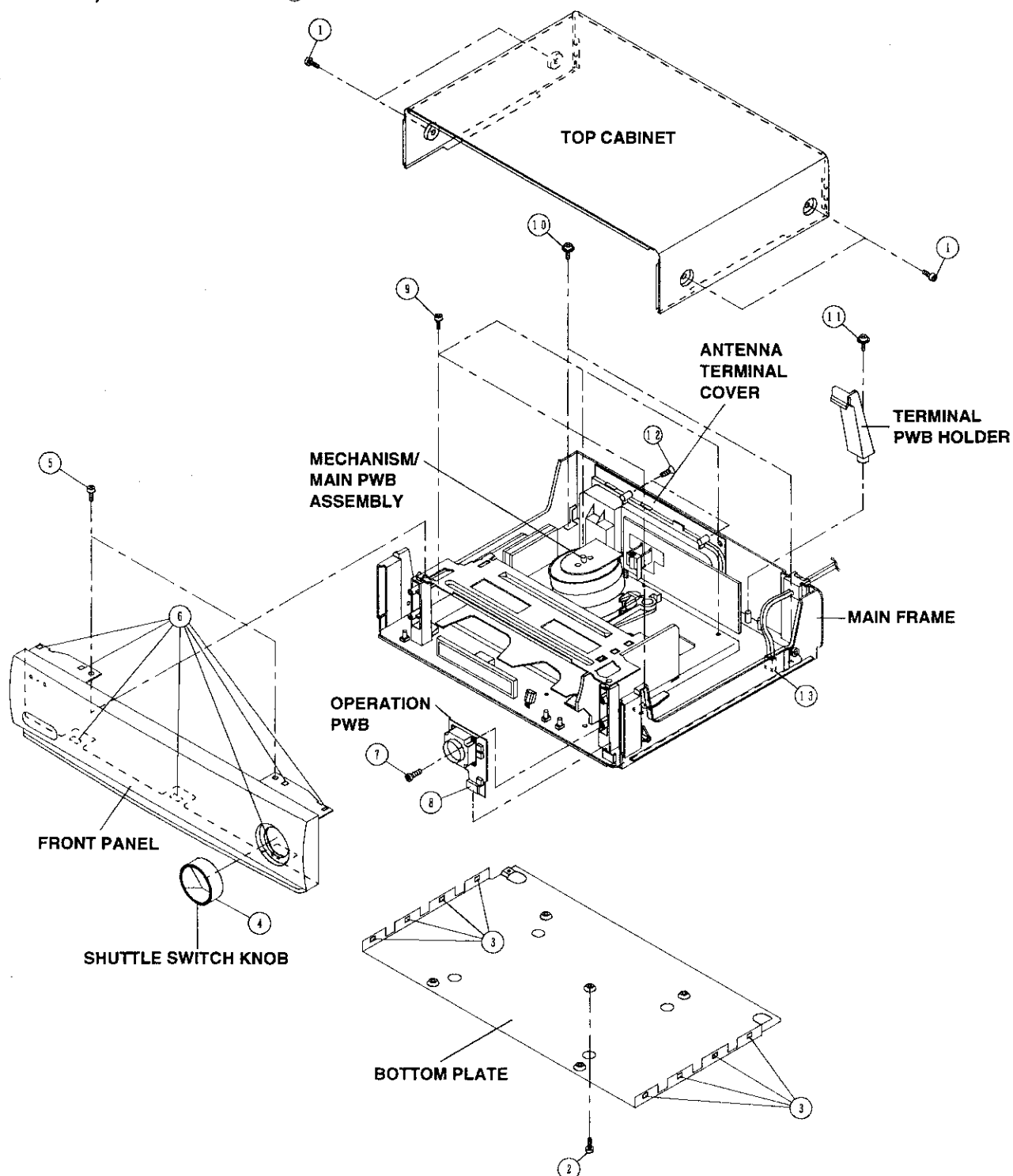
2. DISASSEMBLY AND REASSEMBLY

2-1 DISASSEMBLY OF MAJOR BLOCKS

- TOP CABINET** : Remove 4 screws ①.
- BOTTOM PLATE** : Remove 1 screw ② and 8 hooks ③.
- FRONT PANEL** : Remove shuttle switch knob ④.
Remove 2 screws ⑤ and 7 clips ⑥.
- OPERATION (SHUTTLE JOG) PWB** : Remove 1 screw ⑦. Take it out of connector ⑧.

MECHANISM/ MAIN PWB ASSEMBLY

- : Remove 4 screws ⑨, 2 screws ⑩. Remove 1 screws ⑪ and terminal PWB holder. Remove 2 screws ⑫ and 1 connector ⑬. Lift the antenna terminal cover and take the assembly out of the main frame.



2-2 DISASSEMBLING THE MECHANISM/MAIN PWB ASSEMBLY

SHIELD CASE : Remove 1 screw ⑭ and 1 screw ⑮.

ANTENNA TERMINAL COVER : Remove 2 screws ⑯ and 1 screw ⑰

MECHANISM CHASSIS/ CASSETTE HOUSING ASSEMBLY : Remove 3 FFCs and 2 harnesses ⑱.

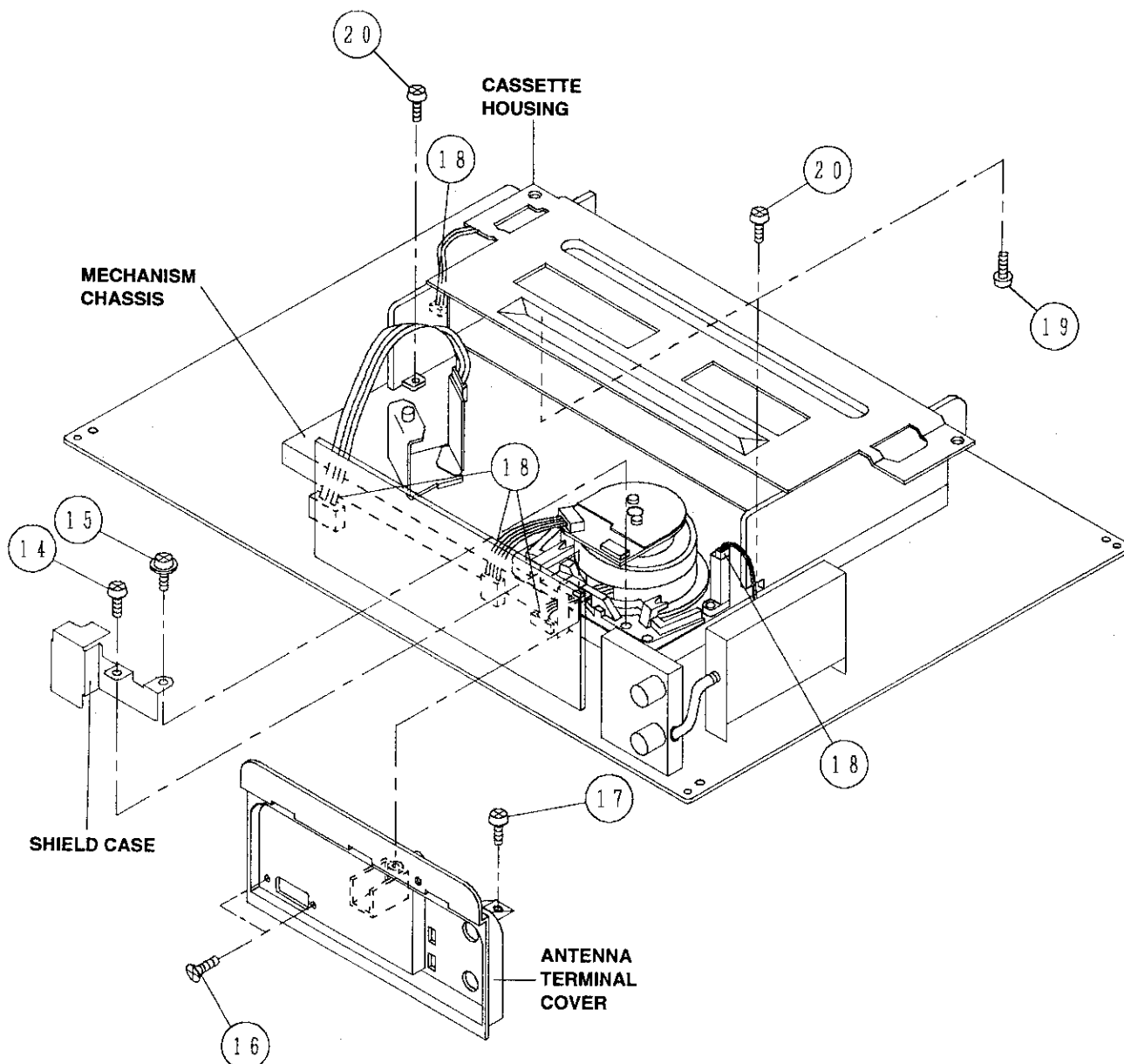
: Be careful not to confuse the top and bottom of the FFC.

CASSETTE HOUSING

Remove 1 screw ⑲ from behind the main PWB.

Lift the mechanism chassis/cassette housing assembly vertically to take it out of the main PWB.

: Remove 2 screws ⑳.



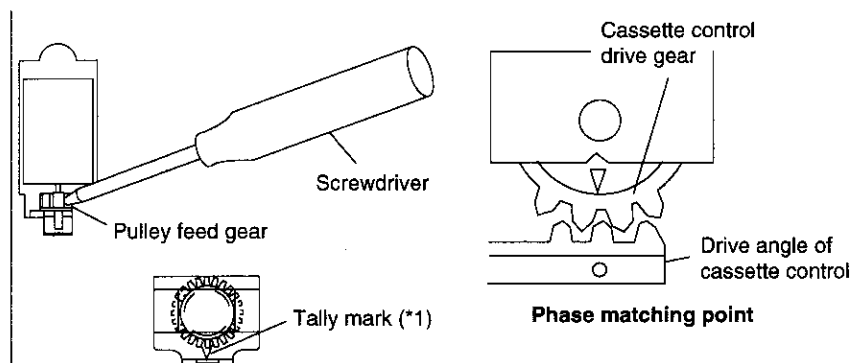
2-3 PRECAUTIONS IN REASSEMBLING

ROUTING THE CASSETTE CONTROLLER

Initial setting is indispensable before placing the cassette controller in the mechanism. The initial setting is made in two ways; electrical and mechanical.

Electrical setting:

Make a short-circuit between TP5005 and TP5006, both located at the center on your side on main PWB, with a 22 ohm resistor and be sure that the mechanism is back to its initial setting position (*1). Now place the cassette controller in position. (This method is used when the mechanism has been already set on its PWB.)



Mechanical setting:

Turn the loading motor's pulley feed gear using a screwdriver and be sure that the mechanism is back to its initial setting position (*1). Now place the cassette controller in position. (This method is applicable for the mechanism alone.)

COUPLING THE MECHANISM TO THE PWB

Match the mechanism's projections with the two symbols (round reference and oval sub-reference) on the main PWB. Place the mechanism straight down in position with due care so that the mechanism chassis's outer edges should not damage any parts nearby.

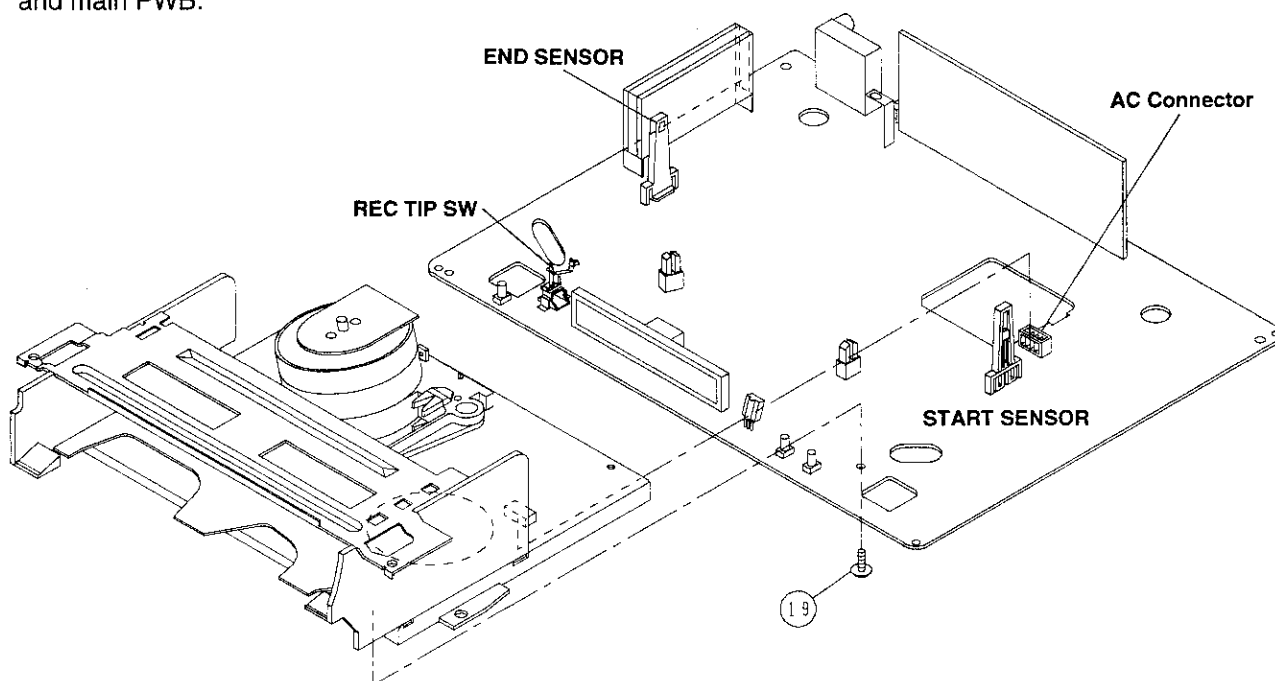
Tighten up the two screws (one for fixing the mechanism and the head amplifier shield, the other on the main PWB's soldering side and located near the loading motor) to fix the mechanism and main PWB. Reconnect the FFC cables (AA, AD and AH) and harnesses (AE and AL) between the mechanism and main PWB.

Parts to pay attention to:

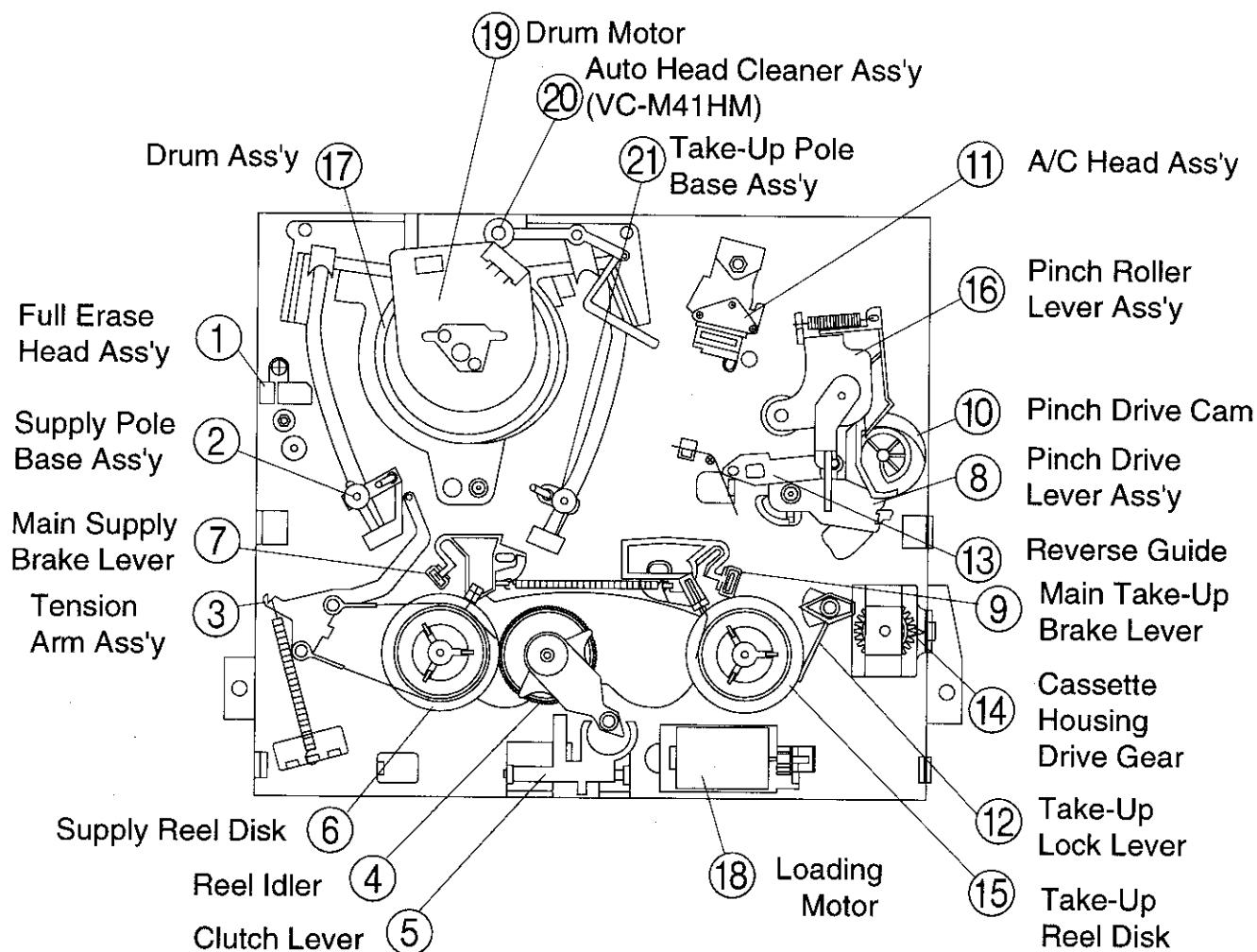
Start and end sensors Q851, Q852

Record tip switch S851

Take special care of the MC-AC connector (board to board) between the mechanism and main PWB.

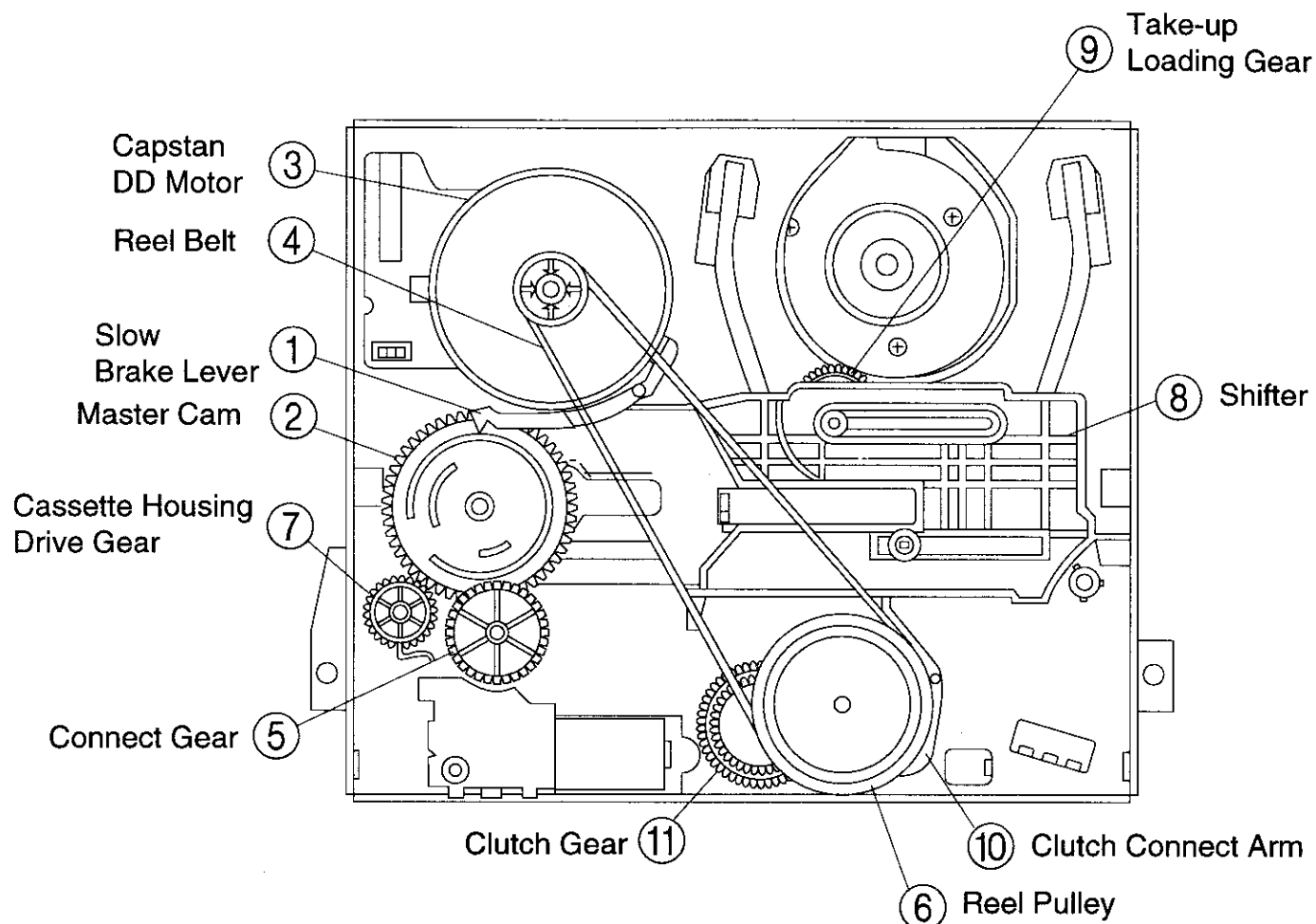


3. FUNCTION OF MAJOR MECHANICAL PARTS (TOP VIEW)



No.	Function	No.	Function
1.	Full erase head ass'y Erase the whole records on the tape in the recording mode.	13.	Reverse guide Pulls out the tape and controls the tape drive train height with the upper and lower guides.
3.	Tension arm ass'y Detects the tension of tape while running, and brakes the supply reel disk via the tension band.	16.	Pinch roller lever ass'y Press-fits the tape to the capstan during tape running. The right protrusion switches the clutch of the cassette housing control assembly in "tape eject", and makes the mechanism eject tape.
7.	Main supply brake lever Brakes the supply reel disk to prevent tape slackening when the unit is stopped in fast forward or rewind mode.	18.	Loading motor A motive power which drives the mechanism. It transmits the power to the master cam and cassette housing control assembly.
9.	Main take-up brake lever Brakes the take-up reel disk to prevent tape slackening when the unit is stopped in fast forward or rewind mode.		

FUNCTION OF MAJOR MECHANICAL PARTS (BOTTOM VIEW)



No.	Function	No.	Function
1.	Slow brake lever Gets in contact with the capstan D.D. motor linking to the master cam in the slow still mode, and brakes it to a certain degree.	6.	Reel pulley Transmits the power of the capstan D.D. motor to the reel disk via the reel idler.
3.	Capstan D.D. motor A motive power which runs the tape. It transmits the power via the reel belt.	8.	Shifter Transmits the operation of the master cam to break and loading gear.
4.	Reel belt Transmits the power to run the tape to the reel pulley.	9.	Take-up loading gear Shifts the take-up pole base and guide roller via the loading relay gear, and applies the tape around the drum assembly, as well as transmits the power to the supply loading gear.

4. ADJUSTMENT, REPLACEMENT AND ASSEMBLY OF MECHANICAL UNITS




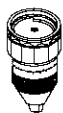
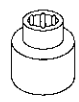
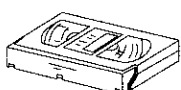
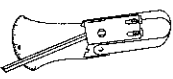
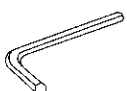
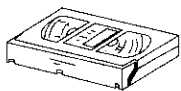
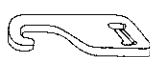
Here we will describe a relatively simple service work in the field, not referring to the more complicated repairs which would require the use of special equipment and tools (drum assembly replacement, for exam-

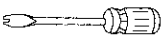

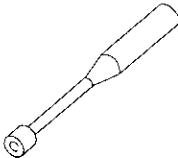

ple).

We are sure that the easy-to-handle tools listed below would be more than handy for periodical maintenance to keep the machine in its original working condition.

TOOLS NECESSARY FOR ADJUSTING THE MECHANICAL UNITS

The following tools are required for proper service and satisfactory repair.

No.	Jig Item	Part No.	Code	Configuration	Remarks
1	Reel Disk Height Adjusting Jig	JiGRH0002	BR		These Jigs are used for checking and adjusting the reel disk height.
2	Master Plane Jig	JiGMP0001	BY		
3	A/C Head Tilt Adjusting Jig	9DAACH-A323U	BX		This Jig is used for setting the A/C head tilt.
4	Torque Gauge (90g)	JiGTG0090	CM		These Jigs are used for checking and adjusting the torque of take-up and supply reel disks.
	Torque Gauge (1.2kg)	JiGTG1200	CN		
5	Gauge Head	JiGTH0006	AW		
6	Cassette Torque Meter	JiGVHT-063	CZ		This cassette torque meter is used for checking and adjusting the torque of take-up for measuring tape back tension.
7	Tension Gauge (300g)	JiGSG0300	BF		There are two gauges used for the tension measurements, 300 g and 2.0kg.
	Tension Gauge (2.0kg)	JiGSG2000	BS		
8	Hex Wrench (0.9mm)	JiGHW0009	AE		These Jigs are used for loosening or tightening special hexagon type screws.
	Hex Wrench (1.2mm)	JiGHW0012	AE		
	Hex Wrench (1.5mm)	JiGHW0015	AE		
9	Alignment Tape (PAL)	VROCPSV	CK		These tapes are especially used for electrical fine adjustment.
	Alignment Tape (PAL)	VROUBZFS			
11	Tension Gauge Adapter	JiGADP003	BK		This Jig is used with the tension gauge. Rotary transformer clearance adjusting jig.

No.	Jig Item	Part No.	Code	Configuration	Remarks
12	Special Bladed Screwdriver	JiGDRIVERH-4	AP		This screwdriver is used for adjusting the guide roller height.
14	Torque Driver	JiGTD1200	CB		This is used to screw down resinmade parts: the specified torque is 5kg.
15	Box Driver	JiGDRIVER110-7	AS		This Jig is used for height adjustment of the A/C head and X-position.
		JiGDRIVER110-4	AV		This Jig is used for replacement of the SI roller.
16	Reverse Guide Height Adjusting Jig	JiGRVGH-F18	BU		This Jig is used for height adjustment of the reverse guide.

MECHANICAL PARTS REQUIRING PERIODICAL INSPECTION

Use the following table as a guide to maintain the mechanical parts in good operating condition.

Parts	Maintained	500 hrs.	1000 hrs.	1500 hrs.	2000 hrs.	Possible symptom encountered	Remarks
Guide roller ass'y		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	Lateral noises Head occasionally blocked	Abnormal rotation or significant vibration requires replacement.
Supply impedance roller		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>		Clean with pure high quality isopropyl alcohol.
Supply impedance roller (inner hole and shaft)			<input type="checkbox"/>		<input type="checkbox"/>		Clean tape contact part with the specified cleaning liquid.
Supply impedance roller flange		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Retaining guide		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Slant pole		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>		
Video head (upper drum ass'y)		<input type="checkbox"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>	Poor S/N ratio, no colour	Clean tape contact area with the specified cleaning liquid.
Full-erase head		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	Poor colour, beating	
A/C head		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	Sound too small or distorted	
Lower drum ass'y						Poor flatness of the envelope with alignment tape	
Capstan D.D. Motor		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	No tape running, uneven colour	
Pinch roller		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	No tape running, tape slack	Clean rubber and rubber contact area with the specified cleaning liquid.
Reel belt			<input type="checkbox"/>		<input type="radio"/>	No tape running, tape slack, no fast forward/rewind motion	
Tension band ass'y					<input type="radio"/>	Cassette not loaded or unloaded	
Loading Motor					<input type="radio"/>		
Reel idler ass'y						No tape running	
Reel pully ass'y			<input type="checkbox"/>		<input type="checkbox"/>		
Clutch gear ass'y					<input type="radio"/>		
Main supply/take-up brake levers					<input type="radio"/>	Tape slack	
AHC (Automatic Head Cleaner) [VC-M41HM]							Replace the roller of the cleaner when it wears down. Just change the AHC roller assembly for new one.

NOTE: ○: Part replacement.
☐: Cleaning (For cleaning, use a lint-free cloth dampened with pure isopropyl alcohol).
☐△: Oil refilling (The indicated point should be lubricated with high quality spindle oil every 1000hrs).

If the reading is out of the specified value, clean or replace the part.

REMOVAL AND REASSEMBLY OF CAS-
SETTE HOUSING CONTROL ASSEMBLY

• Removal

1. Set the cassette ejected condition in the cassette eject mode.
2. Unplug the recorder from the main source.
3. Follow the procedures below in the specified order.
 - a) Remove the cassette housing installation screws ① and ②.
 - b) Slide and pull out the cassette housing control assembly upward.

• Reassembly

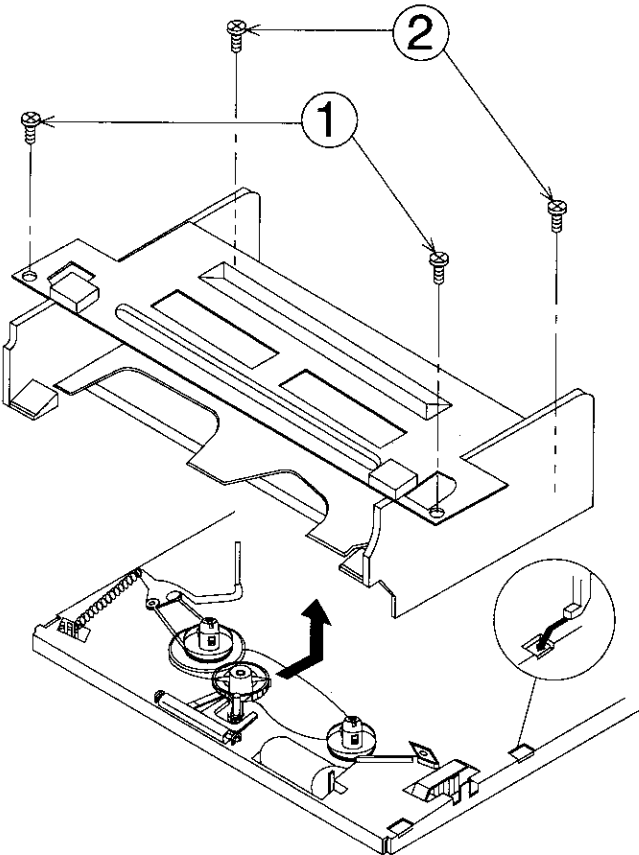


Figure 4-1.

1. Before installation of the cassette housing control assembly, make a short-circuit between TP5005 and TP5006, both located at the center on your side on the main PWB, with a 22 ohm resistor. Plug in the power cord. The cassette control drive gear starts and stops just when a tally mark appears in the mechanism chassis window. Align this tally mark with the cassette control drive angle's mark, as shown in Fig. 4-2, to position the cassette control on the mechanism chassis.
2. Follow the procedures for removal in the reverse order.

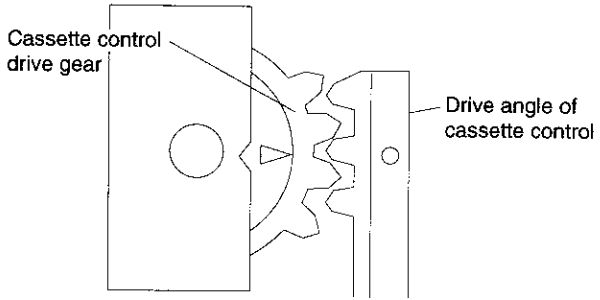


Figure 4-2.

Notes:

- ① In using a magnet screw driver, be sure to keep it away from the A/C head, FE (Full Erase) head, or the drum.
- ② In removal and reassembly, take care not to hit the cassette housing control assembly or tools against the guide pin, drum, or the like thereabout.
- ③ Load the cassette once onto the cassette housing control assembly after reassembly.

TO RUN A TAPE WITHOUT THE CAS-
SETTE HOUSING CONTROL ASSEMBLY

1. Be sure to make a short-circuit between TP5005 and TP5006, both located at the center on your side on the main PWB, with a 22 ohm resistor, before turning on the power.
2. Plug in the power cord.
3. Turn on the power switch.
4. Open the lid of a cassette tape by hand.
5. Hold the lid with two pieces of vinyl tape.
6. Set the cassette tape in the mechanism chassis.
7. Stabilize the cassette tape with a weight (500g) to prevent floating.
8. Perform running test.

Note:

The weight should not be more than 500g.

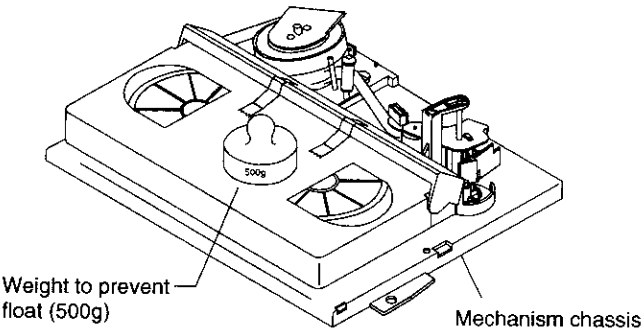


Figure 4-3.

REPLACEMENT AND HEIGHT CHECKING AND ADJUSTMENT OF REEL DISKS

• Removal (Supply and Take-up reel disks)

1. Remove the cassette housing control assembly.
2. Pull the tension band out of the tension arm.
3. Remove the supply main brake and the take-up main brake.
4. Open the hook at the top of the reel disk, and remove the reel disk.

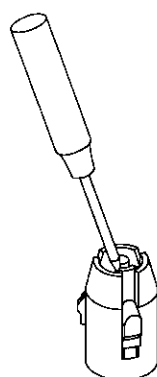
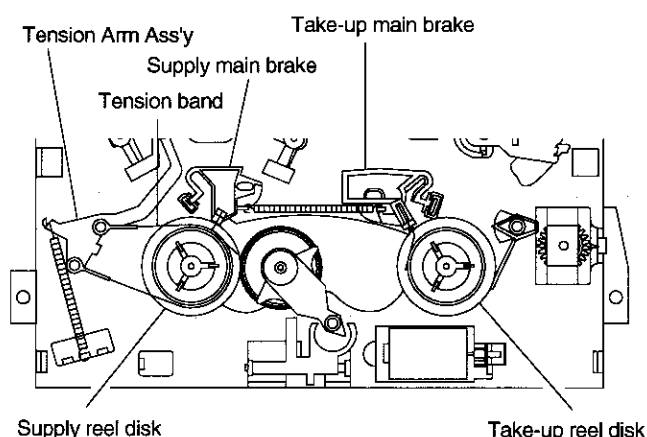


Figure 4-4.

Note:

When the tension band is pressed in the direction of the arrow for removal, the catch is hard to be deformed.



Figure 4-5.

• Reassembly (Supply reel disk)

1. Clean the reel disk shaft and apply oil to it.
2. Install a new supply reel disk onto the shaft.
3. Replace the tension band around the supply reel disk, and insert it to the hole of the tension arm.
4. Check the reel disk height and reassemble the supply main brake.

Notes:

- ① Take enough care not to deform the tension band during installation of the supply reel disk.
- ② Be careful not to damage the supply main brake.

• Reassembly (Take-up reel disk)

1. Clean the reel disk shaft and apply oil to it.
2. Install a new take-up reel disk onto the shaft.
3. Check the reel disk height and reassemble the take-up main brake.

Note:

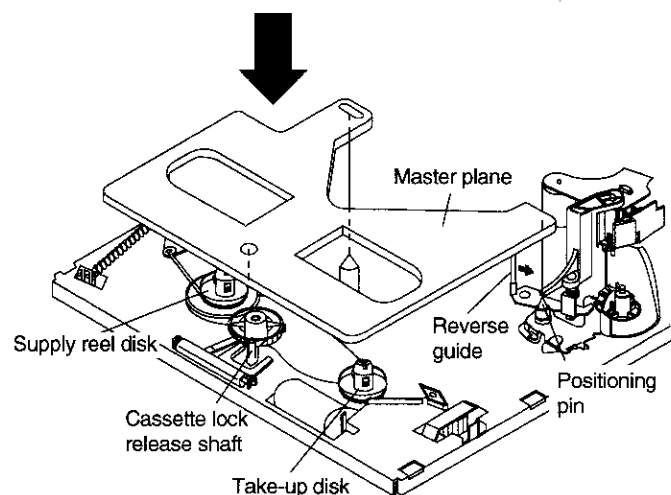
Take care not to damage the take-up main brake.

- * After reassembly, check the video search rewind back tension (see page 18), and check the brake torque (see page 21).

• Height checking and adjustment

Note:

Place the master plane onto the mechanism unit, taking care not to hit the drum (see Figure 4-6).



Set the master plane releasing the reverse guide by a finger.

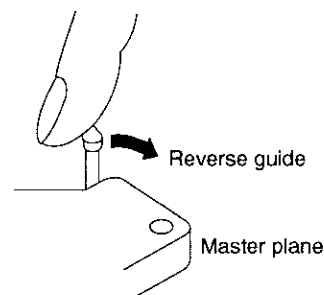


Figure 4-6.

- Check that the reel disk is lower than part A but higher than part B. If the height is not correct, readjust the reel disk height by changing the poly-slider washer under the reel disk.

Note:

Whenever replacing the reel disk, perform the height checking and adjustment.

CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN FAST FORWARD MODE

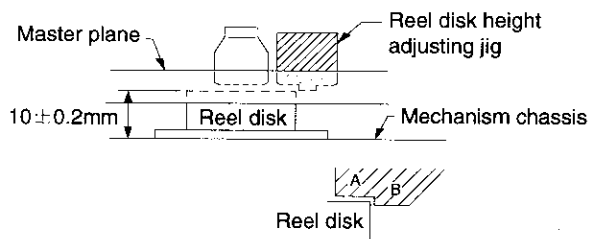


Figure 4-7.

- **Remove the cassette housing control assembly.**
- **Make a short-circuit between TP5005 and TP5006, both located at the center on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.**
- **Setting**
 1. Set a torque gauge to zero on the scale. Place it on the take-up reel disk.
 2. Press the FF button to set the mechanism to the fast forward mode.
- **Checking**
 1. Turn the torque gauge slowly (one rotation every 2 to 3 seconds) by hand in the take-up direction.
 2. Check to see if the take-up torque is higher than 69 mN•m (700 gf•cm).

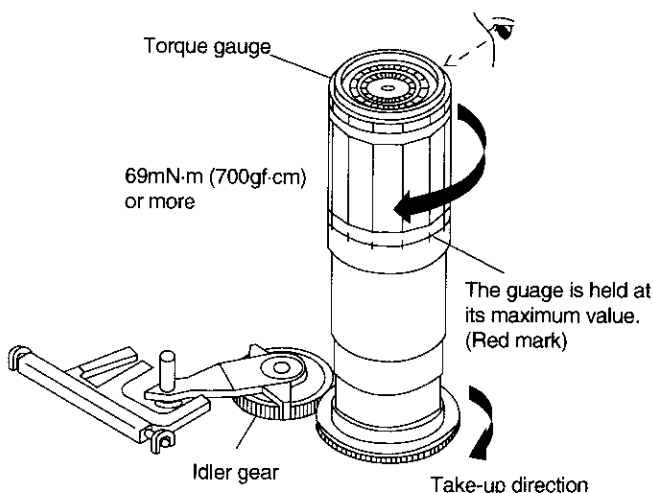


Figure 4-8.

Adjustment

1. If the take-up torque is outside the range, clean the capstan D.D. motor pulley, reel belt and reel pulley with cleaning liquid, then recheck the torque.
2. If the take-up torque is still out of range, replace the reel belt.

Notes:

1. Hold down the torque gauge so that it may not fly off.
2. When checking the take-up torque, do not keep the reel disk locked for a longer time.

CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN REWIND MODE

- **Remove the cassette housing control assembly.**
- **Make a short-circuit between TP5005 and TP5006, both located at the center on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.**
- **Setting**
 1. Set a torque gauge to zero on the scale. Place it on the supply reel disk.
 2. Press the REW button to set the mechanism to the rewind mode.
- **Checking**
 1. Turn the torque gauge slowly (one rotation every 2 to 3 seconds) by hand in the take-up direction.
 2. Check to see if the take-up torque is higher than 69 mN•m (700 gf•cm).
- **Adjustment**

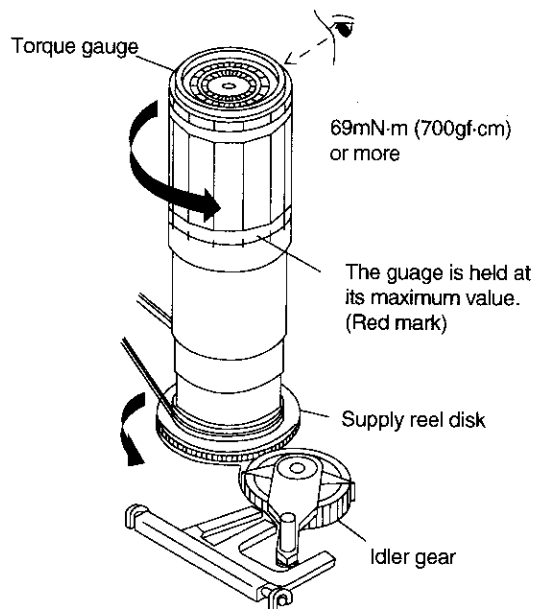


Figure 4-9.

1. If the take-up torque is outside the range, clean the capstan D.D. motor pulley, reel belt and reel pulley with cleaning liquid, then recheck the torque.
2. If the take-up torque is still out of range, replace the reel belt.

Notes:

1. Hold down the torque gauge so that it may not fly off.
2. When checking the take-up torque, do not keep the reel disk locked for a longer time.

CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN PLAYBACK MODE

1. Remove the cassette housing control assembly.
2. Make a short-circuit between TP5005 and TP5006, both located at the center on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.
3. Open the lid of the cassette torque meter, and hold it with two pieces of vinyl tapes.
4. Load the cassette torque meter into the unit.
5. Put the weight (500g) on the cassette torque meter.
6. Press the REC button to put the unit in REC mode.

Set value SP $8.8 \pm 3.8 \text{ mN}\cdot\text{m}$ ($90 \pm 39 \text{ gf}\cdot\text{cm}$)

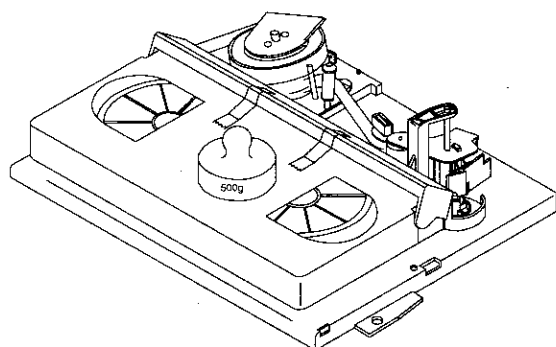


Figure 4-10.

• **Checking**

1. Check that the torque is in the range of $8.8 \pm 3.8 \text{ mN}\cdot\text{m}$ ($90 \pm 39 \text{ gf}\cdot\text{cm}$).
2. The torque fluctuates due to the rotational deviation of the reel pulley ass'y. Use the center of the fluctuation as the value.
3. Place the ass'y in the SP record mode, and check that the take-up torque is within the range.

• **Adjustment**

If the take-up torque in the playback mode is outside the range, replace the reel pulley ass'y.

Note:

Stabilize the cassette torque meter to prevent floating.

CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN VIDEO SEARCH REWIND MODE

- **Remove the cassette housing control assembly.**
- **Make a short-circuit between TP5005 and TP5006, both located at the center on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.**
- **Setting**
 1. Push the PLAY button to place the ass'y in the playback mode.
 2. Push the REW button to place the ass'y in the video search rewind mode.
- **Checking**
 1. Place the torque gauge on the supply reel disk, and turn it counterclockwise very slowly (one rotation every 1 to 2 seconds) and check that the torque is within the set value $14.5^{+8}_{-6} \text{ mN}\cdot\text{m}$ ($148^{+80}_{-60} \text{ gf}\cdot\text{cm}$)

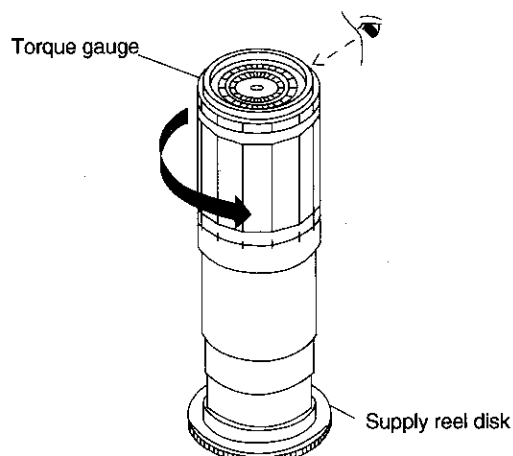


Figure 4-11.

Note:

Set the torque gauge securely on the supply reel disk. If it is not secure, the measurement will be incorrect.

• **Adjustment**

If the take-up torque in video search rewind mode is outside the range, replace the reel pulley ass'y.

Note:

The torque fluctuates due to the rotational deviation of the reel pulley ass'y. Use the center of the fluctuation at the value.

CHECKING THE FAST FORWARD BACK TENSION

- Remove the cassette housing control assembly.
- Make a short-circuit between TP5005 and TP5006, both located at the center on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.
- Checking
 1. Push the FF button to place the ass'y in the fast forward mode.
 2. Place the torque gauge on the supply reel disk, and turn it clockwise very slowly (one rotation every 2 to 3 seconds) and check that the torque is $1.5 \pm 0.9 \text{ mN}\cdot\text{m}$ ($15 \pm 9 \text{ gf}\cdot\text{cm}$).

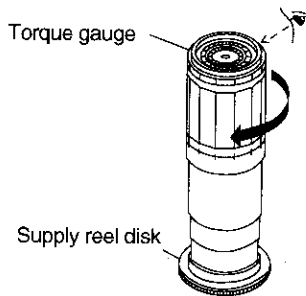


Figure 4-12.

Notes:

- ① Set the torque gauge securely on the supply reel disk. If the torque gauge is not securely set on the reel disk, measurement will be incorrect.
- ② Measure the torque with the torque gauge's weight exerted on the reel disk.

CHECKING THE REWIND BACK TENSION

- Remove the cassette housing control assembly.
- Make a short-circuit between TP5005 and TP5006, both located at the center on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.
- Checking
 1. Push the REW button to place the ass'y in the rewind mode.
 2. Place the torque gauge on the take-up reel disk, and turn it counterclockwise very slowly (one rotation every 2 to 3 seconds) and check that the torque is $1.3 \pm 0.8 \text{ mN}\cdot\text{m}$ ($13 \pm 8 \text{ gf}\cdot\text{cm}$).

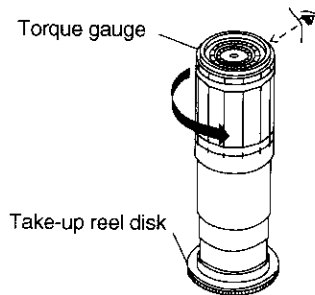


Figure 4-13.

Notes:

- ① Set the torque gauge securely on the take-up reel disk. If it is not secure, the measurement will be incorrect.
- ② Measure the torque with the torque gauge's weight exerted on the reel disk.

CHECKING THE VIDEO SEARCH REWIND BACK TENSION

- Remove the cassette housing control assembly.
- Make a short-circuit between TP5005 and TP5006, both located at the center on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.
- Checking
 1. Push the PLAY button to place the ass'y in the playback mode.
 2. Push the rewind button to place the ass'y in the video search rewind mode.
 3. Place the torque gauge on the take-up reel disk, and turn it counterclockwise very slowly (one rotation every 2 to 3 seconds) and check that the torque is within the set value $4 \pm 1.7 \text{ mN}\cdot\text{m}$ ($41 \pm 17 \text{ gf}\cdot\text{cm}$).

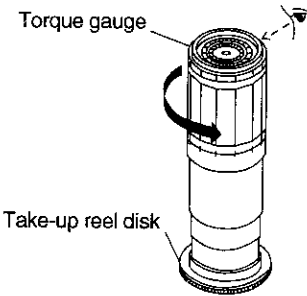


Figure 4-14.

Notes:

- ① Set the torque gauge securely on the take-up reel disk. If it is not secure, the measurement will be incorrect.
- ② Measure the torque with the torque gauge's weight not exerted on the reel disk.

CHECKING THE PINCH ROLLER PRESSURE

- Remove the cassette housing control assembly.
- Make a short-circuit between TP5005 and TP5006, both located at the center on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.
- Checking

Push the PLAY button to place the ass'y in the playback mode.

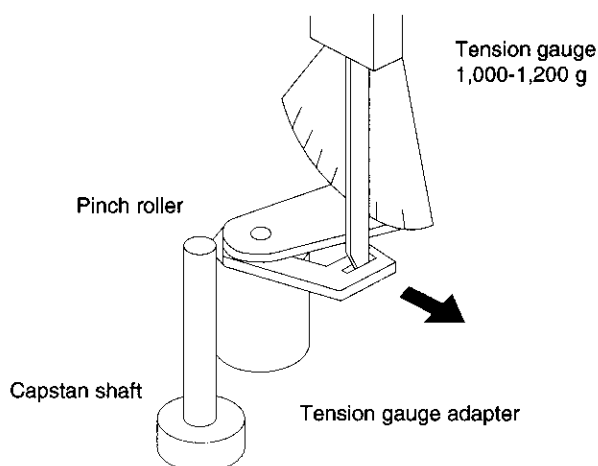


Figure 4-15.

1. Detach the pinch roller from the capstan shaft.
2. Set the tension gauge by hooking the tension gauge adapter onto the pinch roller shaft.
3. Gradually release the pressure to allow the pinch roller to touch the capstan shaft. When the pinch roller just touches the capstan shaft, read the indication on the gauge.
4. Check that the reading of the tension gauge is in the range of 900 to 1200 g.

CHECKING AND ADJUSTMENT OF TENSION POLE POSITION

- Remove the cassette housing control assembly.
- Make a short-circuit between TP5005 and TP5006, both located at the center on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.

• Setting

1. Open the lid of cassette tape (E-180), and hold it with two pieces of vinyl tapes.
2. Load the cassette tape into the unit.
3. Put the weight (500g) on the cassette tape.
4. Make the adjustment with the beginning of a E-180 tape.

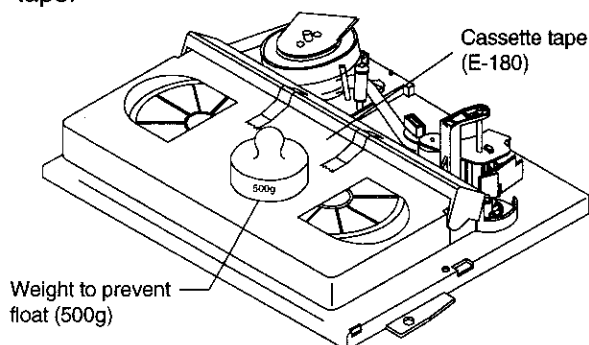


Figure 4-16.

• Checking

1. Set a cassette tape, press the REC button and get the tape loaded. Now check the tension pole position.

2. Visually check to see if the left end of the tension pole is in alignment with the line 0.2 mm left of the center line of the SI roller. Readjust as required in the following steps.

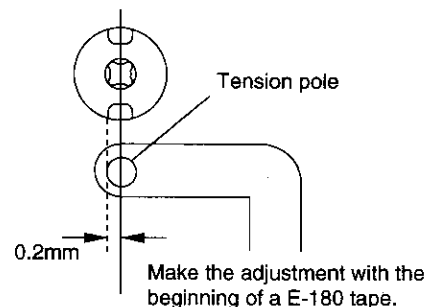


Figure 4-17.

- ① If the end is at the left from the dotted line:

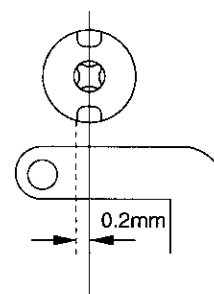


Figure 4-18.

1. Remove the cassette and press the REC button to make an empty loading. Put a bladed screwdriver into the tension band positioning cam and turn it clockwise.
2. Place the cassette in position and check the tension pole position.

- ② If the end is at the right from the dotted line:

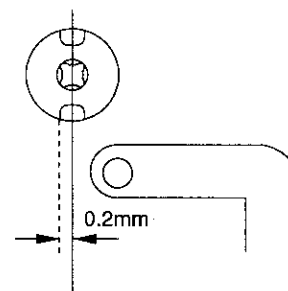


Figure 4-19.

1. Remove the cassette and press the REC button to make an empty loading. Put a bladed screwdriver into the tension band positioning cam to turn it counter-clockwise.
2. Place the cassette in position and check the tension pole position.

Notes:

- ① The tension band positioning cam cannot be adjusted with a cassette in place because the cam will be located below the cassette. Repeat a series of steps; empty loading, adjustment, cassette placement and position checking.
- ② Turn the positioning cam clockwise to move the tension pole to the right (in the black-arrow direction). Turn it counterclockwise to move the tension pole to the left (in the white-arrow direction).

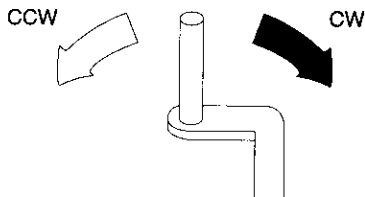


Figure 4-20.

- ③ Adjustable range of the tension pole positioning cam.

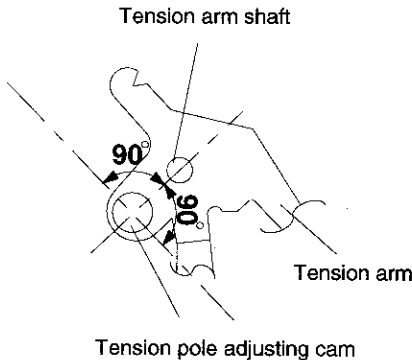


Figure 4-21.

Adjust the tension pole positioning cam so that the arrow mark on the cam be within 90° left and right from the tension arm shaft's center.

CHECKING AND ADJUSTMENT OF RECORD/PLAYBACK BACK TENSION

- Remove the cassette housing control assembly.
- Make a short-circuit between TP5005 and TP5006, both located at the center on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.
- **Setting**
 - 1. Open the lid of the cassette torque meter, and hold it with two pieces of vinyl tapes.
 - 2. Load the cassette torque meter into the unit.
 - 3. Put the weight (500g) on the cassette torque meter.

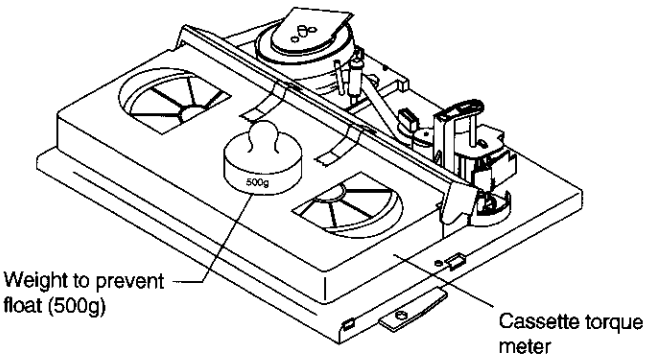


Figure 4-22.

• Checking

- 1. Push the REC button to place the unit in the record mode.
- 2. Check that the back tension indicated by the gauge is within the set range 31 to 38 g•cm.

Notes:

- 1. Make sure that the video cassette tape is over the retaining guide.
- 2. Make sure that the tape is not slack nor damaged at either end.

• Adjustment

- 1. If the reading of the cassette torque meter is less than specified, move the tension spring hook toward A.
- 2. If the reading of the cassette torque meter is more than specified, move the tension spring hook toward B.

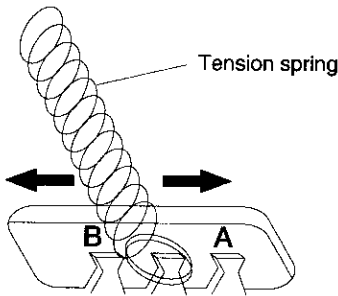
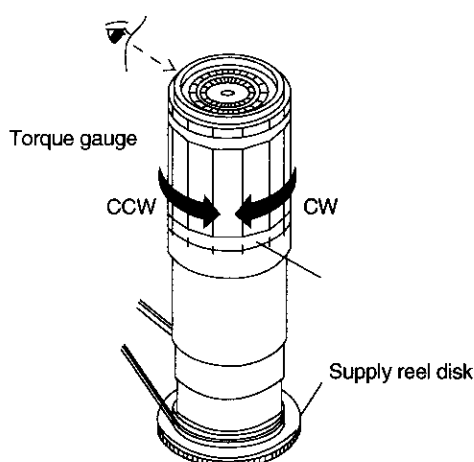


Figure 4-23.

CHECKING THE BRAKE TORQUE

- **Checking the brake torque at the supply side**



CCW:	5~15mN·m (50~150gf·cm)
CW:	10~32mN·m (102~326gf·cm)

Figure 4-24.

- **Remove the cassette housing control assembly.**

- **Make a short-circuit between TP5005 and TP5006, both located at the center on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.**

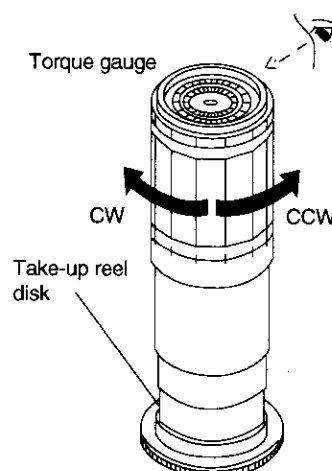
- **Setting**

1. Set a torque gauge to zero on the scale. Place it on the supply reel disk.
2. Switch from the FF mode to the STOP mode.
3. Disconnect the AC power plug.

- **Checking**

1. Slowly rotate the torque gauge in the clockwise (CW) direction and counterclockwise (CCW) direction of the supply brake so that the reel disk and the indicator of the torque gauge rotate at an equal rate. Check that the values are within the range of CW direction = 10~32mN·m (102~ 326gf·cm), CCW direction = 5~15mN·m (50~ 150gf·cm), and that the brake torque in the CW direction is at least twice as high as that in the CCW direction.

- **Checking the brake torque at the take-up side**



CCW:	10~32mN·m (102~326gf·cm)
CW:	5~15mN·m (50~150gf·cm)

Figure 4-25.

- **Remove the cassette housing control assembly.**

- **Make a short-circuit between TP5005 and TP5006, both located at the center on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.**

- **Setting**

1. Set a torque gauge to zero on the scale. Place it on the take-up reel disk.
2. Switch from the FF mode to the STOP mode.
3. Disconnect the AC power plug.

- **Checking**

1. Slowly rotate the torque gauge in the clockwise (CW) direction and counterclockwise (CCW) direction of the take-up brake so that the reel disk and the indicator of the torque gauge rotate at an equal rate. Check that the values are within the range of CCW direction = 10~32mN·m (102~326gf·cm), CW direction = 5~15mN·m (50~ 150gf·cm), and that the brake torque in the CCW direction is at least twice as high as that in the CW direction.

- **Adjustment of the brake torque at the supply side and the take-up side**

1. If the supply or take-up brake torque is outside the range, clean the supply or take-up reel disk break lever pad, then recheck the torque.
2. If the supply or take-up brake torque is still outside the range, replace the main brake ass'y or the main brake spring.

Note:

When the main brake is replaced, perform the height checking and adjustment of reel disks (see page 15), and the brake torque checking.

REPLACEMENT OF A/C (Audio/Control)
HEAD

- 1. Remove the cassette housing control assembly.
- 2. Place the unit in the unloading mode, and unplug the power cord.

• Removal

- 1. Loosen the tilt adjusting screw ①.
- 2. Remove the azimuth adjusting screw ②.
- 3. Remove the A/C head screw ③.
- 4. Unsolder the A/C head PWB soldered to the A/C head assembly.

Notes:

- 1. After replacement, be sure to perform the adjustment of the tape drive train (see page 24). Under any circumstances, avoid touching the head. Clean the head, if touched with your finger, with alcohol.
- 2. Take care that the azimuth spring does not fly off when removing the A/C head screw.

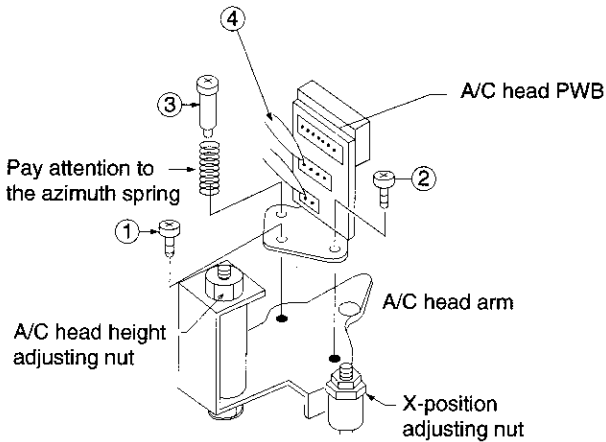


Figure 4-26.

• Replacement

- 1. Solder the removed A/C head PWB onto a new A/C head assembly.
- 2. The A/C head assembly is attached so that the A/C head arm and A/C head plate are roughly parallel to each other.

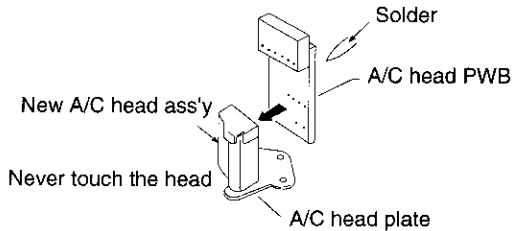


Figure 4-27.

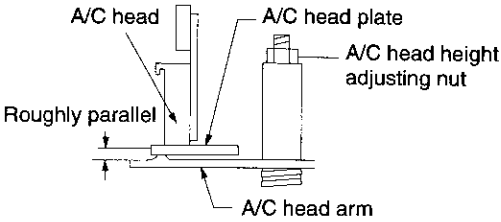
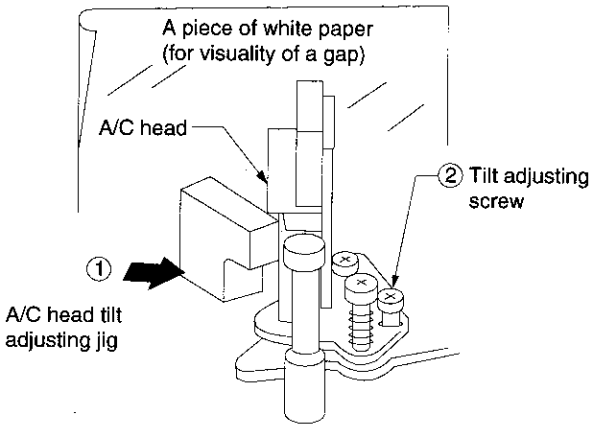


Figure 4-28.

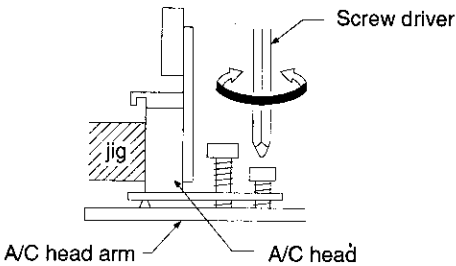
• Adjustment

[A/C head tilt angle]

- 1. Set the mechanism to the loading mode.
- 2. Place the A/C head tilt adjusting Jig ①.
- 3. Slowly turn the tilt adjusting screw ② with a screw driver until there is no gap between the Jig and the A/C head.



(a)

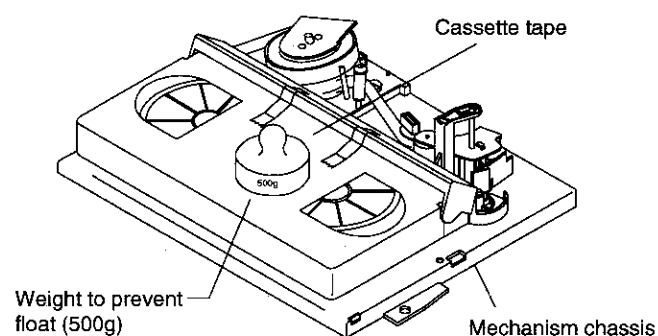
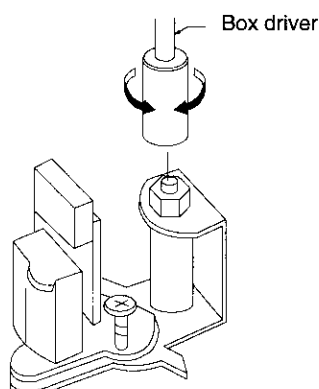


(b)

Figure 4-29.

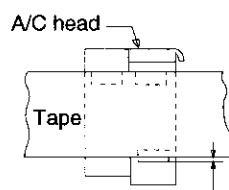
[A/C head height rough adjustment]

• Setting



- ① Roughly adjust the height of the A/C head by turning the A/C head adjusting hexagon nut with the specialized box driver until the tape is in the position shown below.
- ② Set the cassette tape to the mechanism chassis.
- ③ Press the PLAY button to put the unit in the playback mode.

• Adjustment



Adjust the nut visually so that the control head is visible 0.3 to 0.5mm below the bottom of the tape.

Figure 4-30.

HEIGHT ADJUSTMENT OF REVERSE GUIDE

[Height adjustment of reverse guide]

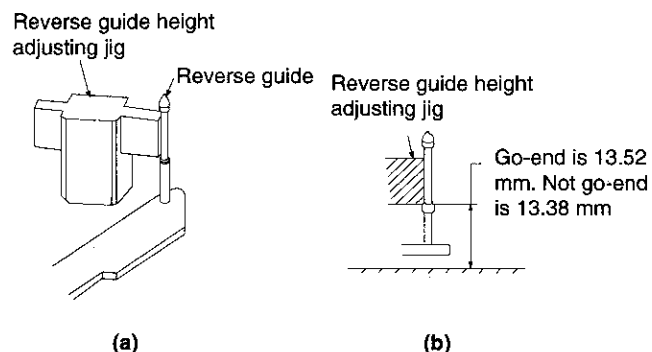


Figure 4-31.

1. In the tape load mode, make adjustment at the 13.38mm side first and then rotate the height adjusting nut by 1/6 turn counterclockwise.
2. Actually load the unit with a tape, put it in the play mode, and make sure the tape is free from wrinkles near the reverse guide.
3. Use a commercially available box driver to turn the height adjusting nut.

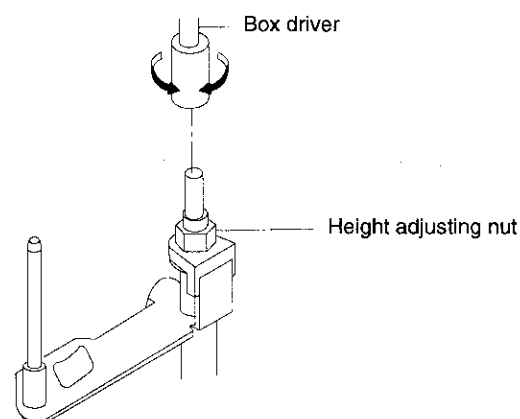


Figure 4-32.

ADJUSTMENT OF TAPE DRIVE TRAIN

- 1. Remove the cassette housing control assembly.
- 2. Make a short-circuit between TP5005 and TP5006, both located at the center on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.
- 3. Check and adjust the position of the tension pole. (See page 19.)
- 4. Check and adjust the video search rewind back tension. (See page 18.)
- 5. Set the tilt angle of the A/C head. (See page 22.)
- 6. Rough adjustment of tape drive train.
 - a) Connect the oscilloscope to the test point for PB CHROMA envelope output (TP301). Set the synchronism of the oscilloscope to EXT. The PB CHROMA signal is to be triggered by the head switching pulse (TP302).
 - b) Loosen the setscrew at the lower part of the guide roller, and adjust it with an adjusting screw driver (JIGDRIVERH-4) so that the guide roller turns smoothly. (Do not overloosen the setscrew, which causes insecurity of the guide roller.) (See Figure 4-33.)
 - c) Set the alignment tape (monoscope pattern) on the reel disk, and place the unit in the playback mode. (Place a 500 g weight on the cassette tape to prevent floating of the cassette tape.)

- d) In the X value adjustment mode (see the Electrical

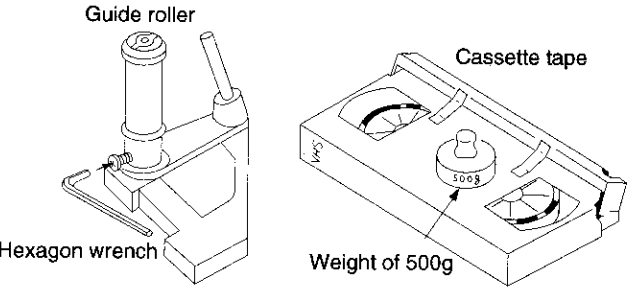
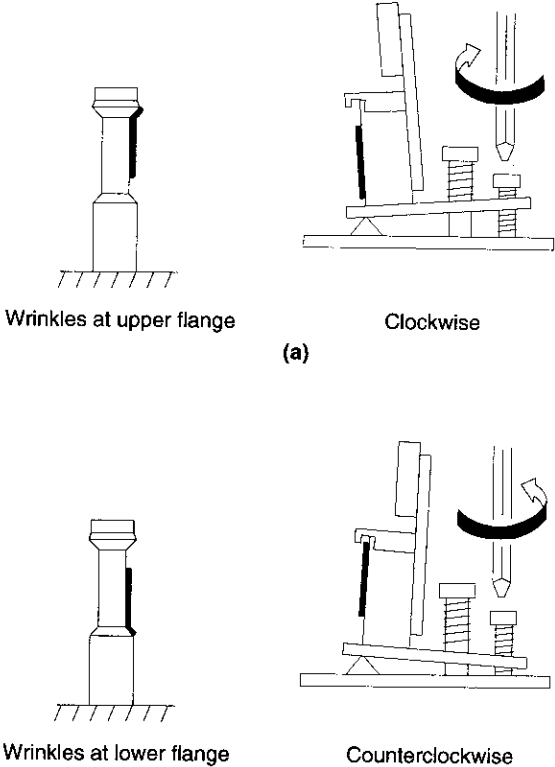


Figure 4-33.

Figure 4-34.

- Adjustment), change the envelope waveform from MAX to MIN, and MIN to MAX by pushing the (+) or (-) tracking button, and check a flat response is obtained on the waveform.
- e) If a flat response cannot be obtained, roughly adjust the guide rollers on the supply side and take-up side using an adjusting screw driver until a flat response can be obtained.
 - f) Turn the A/C head tilt adjusting screw with a screwdriver to prevent the tape from wrinkling at the upper and lower flanges of the fixed guide.
 - 1) Wrinkles at the upper flange : Turn the above adjusting screw clockwise, as shown in Figure 4-35 (a).
 - 2) Wrinkles at the lower flange : Turn the above adjusting screw counterclockwise, as shown in Figure 4-35 (b).



(b)
Figure 4-35.

Notes:

- 1. Place the tracking control in the center position, and adjust the X-position adjusting nut so that the PB CHROMA envelope becomes maximum for easier rough adjustment of the tape drive train.
- 2. In the rough adjustment, pay particular attention to the outlet side.

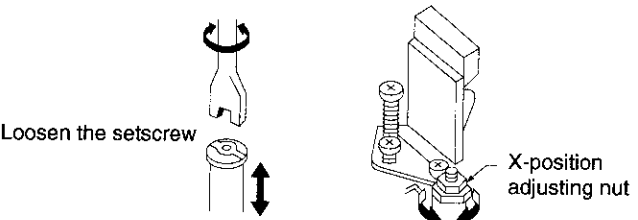


Figure 4-36.

Figure 4-37.

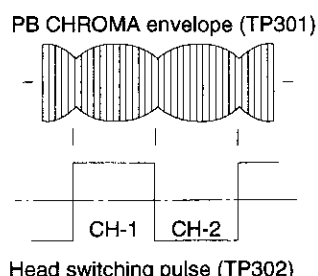


Figure 4-38.

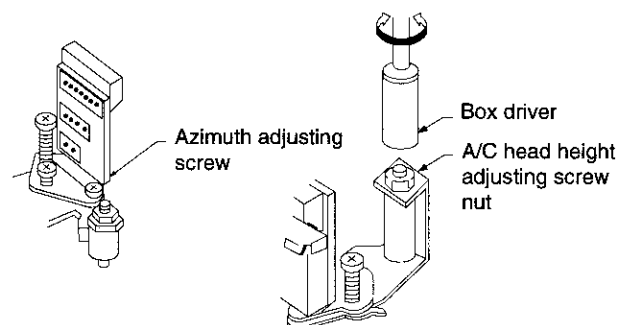


Figure 4-39.

Figure 4-40.

7. Adjustment of A/C head height and azimuth

- Connect an oscilloscope to the audio output terminal.
- Use the alignment tape and play back its audio 6 kHz signal (monoscope pattern for video signal). Adjust the azimuth adjusting screw to obtain the maximum audio output on an oscilloscope. (See Figure 4-39.)
- Use the alignment tape and play back its audio 1 kHz signal (colour bar for video signal) and slowly rotate the A/C head height adjusting nut with the special box driver to obtain the maximum audio output.
- Perform the adjustment in b) again.
- After this adjustment, apply glyptal to the screws and nuts to fix them.

8. Adjustment of tape drive train and X-Position.

(Use the Alignment tape VROUBZFS.)

- Connect the oscilloscope to the test points (TP301) for PB CHROMA envelope output. Set the synchronism of the oscilloscope to EXT. The PB CHROMA signal is to be triggered by the head switching pulse (TP302).
- Play back the tape drive train alignment tape.
- Push the (+) or (-) button to change the envelope waveform from MAX to MIN, and MIN to MAX. Adjust the guide roller's height on the supply and take-up sides with an adjusting screw driver, to obtain an envelope waveform that is as flat as possible.
- If the tape is above or below the helical lead, the PB CHROMA waveform will take the shape shown in Figure 4-41.
- Adjust for maximum flatness of the envelope as the step 6, e) in page 24.
- Push the (+) or (-) tracking button to check that a flat response is obtained on the envelope waveform.

	When the tape is above the helical lead.		When the tape is below the helical lead.	
	Supply side	Take-up side	Supply side	Take-up side
Adjustment	Supply side guide roller rotated in clockwise direction (lowers guide roller) to flatten envelope.	Take-up side guide roller rotated in clockwise direction (lowers guide roller) to flatten envelope.	Supply side guide roller rotated in counterclockwise direction (raises guide roller) to make the tape float above the helical lead. The supply side guide roller is then rotated in the clockwise direction to flatten the envelope.	Take-up side guide roller rotated in counterclockwise direction (raises guide roller) to make the tape float above the helical lead. The take-up side guide roller is then rotated in the clockwise direction to flatten the envelope.

Figure 4-41.

- g) Secure the guide roller by tightening the guide roller setscrew in the unloading mode.
 - h) Play back the tape drive train alignment tape to check that the envelope waveform does not change.
9. Adjustment of A/C head X-position.
- a) In the X value adjustment mode (see the Electrical Adjustment), make a short-circuit between TP5005 and TP5006, both located at the center on your side on the main PWB, with a 22 ohm resistor to center the tracking.
 - b) Rotate the X-position adjusting nut with an adjusting box driver, and adjust the A/C head position for maximum head switching pulse low side envelope.
 - c) Adjust the playback switching point.
 - d) Check the flatness of the envelope waveform and sound by playing back a recorded tape.

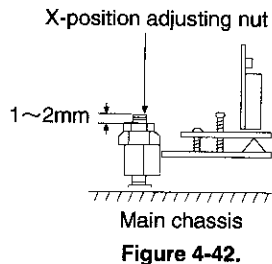


Figure 4-42.

REPLACEMENT OF THE CAPSTAN D.D. (DIRECT DRIVE) MOTOR

- Remove the cassette housing control assembly.
- Removal (Follow the order of indicated numbers.)

- 1. Disconnect from the board-to-board connector on the main PWB.
- 2. Remove the reel belt ①.
- 3. Remove the screws ②.

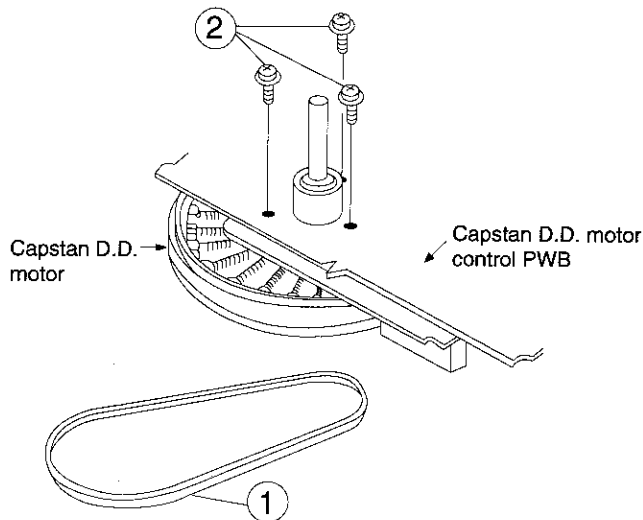


Figure 4-43.

- Reassembly
- 1. Mount the capstan motor on the mechanism chassis making sure not to allow the capstan shaft to hit the mechanism chassis, and attach it with the three screws.
- 2. Attach the reel belt. Reconnect to the board-to board connector on the main PWB.

Notes:

- 1. After installing the capstan D.D. motor, be sure to rotate the capstan D.D. motor and check the movement.
- 2. Check the servo circuit.

REPLACEMENT OF DRUM D.D MOTOR

- 1. Put the unit in the cassette eject position.
- 2. Unplug the power cord.

• Removal (Reverse the order in reassembly.)

- 1. Disconnect the FFC cable ①.
- 2. Unscrew the stator assembly fixing screws ②.
- 3. Take out the stator assembly ③.
- 4. Unscrew the rotor assembly fixing screws ④.
- 5. Take out the rotor assembly ⑤.

Notes:

- 1. In removing the stator assembly, part of the drum earth spring pops out of the pre-load collar. Be careful not to lose it.
- 2. Secure the rotor assembly so that the installation positioning holes in the rotor assembly and upper drum assembly match. (Match the upper drum's notch with the rotor's hole.)
- 3. Be careful not to damage the upper drum or the video head.
- 4. Be sure that the hall device and the stator assembly are not damaged by the rotor assembly or other parts.
- 5. After installation, adjust the playback switching point.

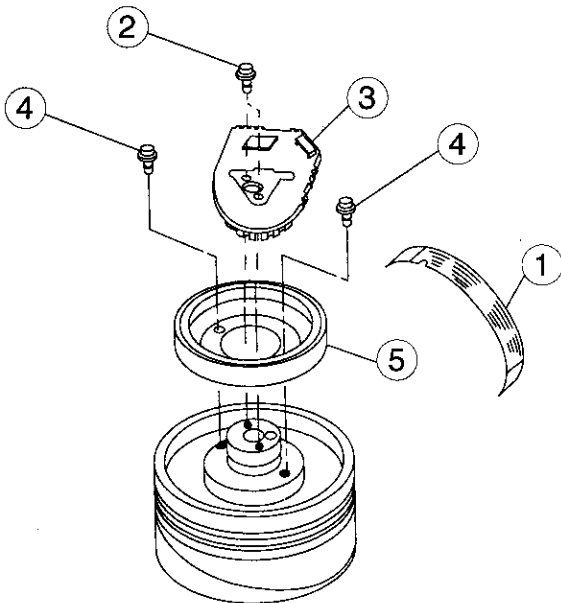


Figure 4-44.

ASSEMBLE THE MECHANISM'S PARTS REQUIRING THE PHASE MATCHING IN THE STEPS BELOW.

1. Assembling the pinch roller assembly and the pinch drive cam (on the front of the mechanism chassis).
2. Mounting the shifter (on the back of the mechanism chassis).
3. Mounting the master cam (on the back of the mechanism chassis).
4. Mounting the connection gear, slow brake and loading motor assemblies (on the back of the mechanism chassis).

1. Assembling the pinch roller assembly and the pinch drive cam (on the front of the mechanism chassis).

Place the following parts in position in numerical order.

- (1) Pinch drive cam ①
- (2) Pinch roller and pinch double-action lever ②
- (3) Open lever ③

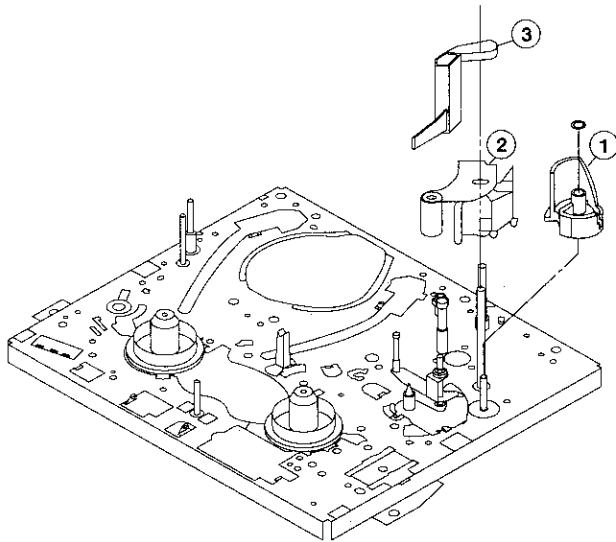
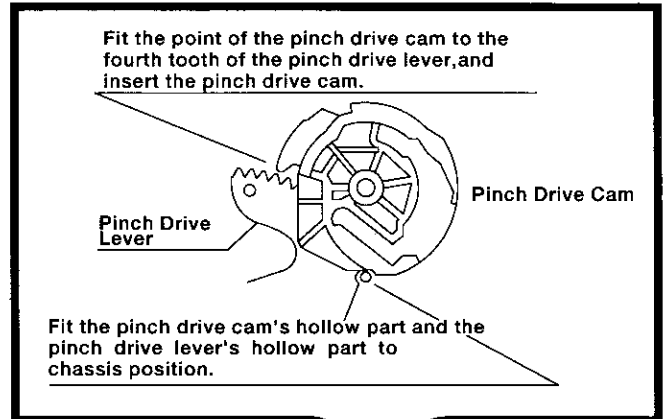


Figure 4-45.

① Insert Pinch Drive Cam.



Phase Matching Point ①

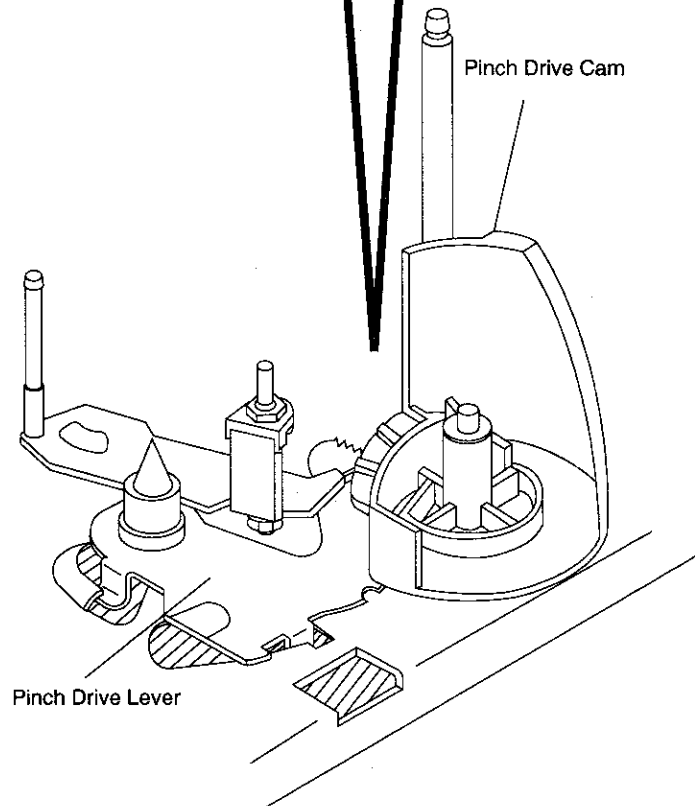


Figure 4-46-1.

② Insert Pinch Roller/Pinch Double Action Lever Ass'y.

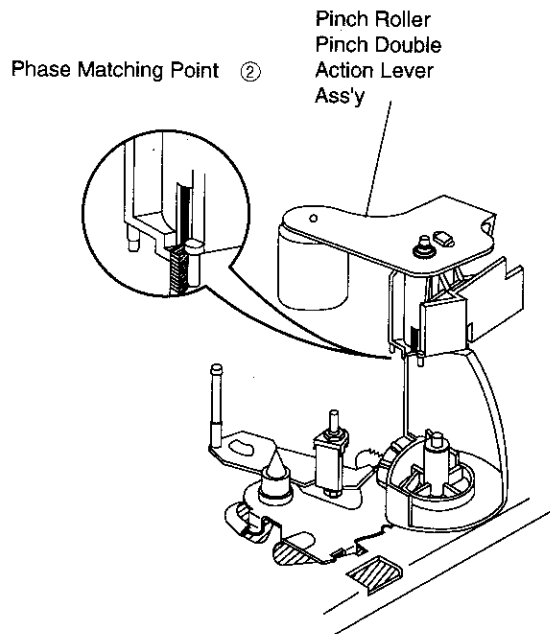


Figure 4-46-2.

③ Insert Open Lever.

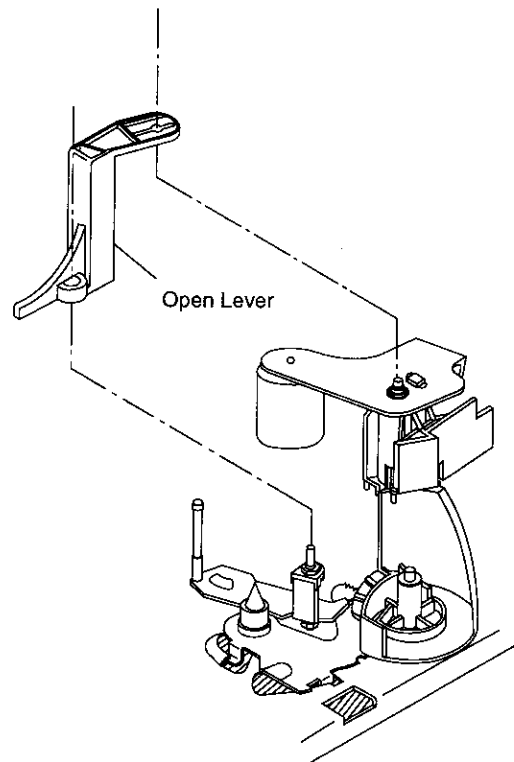


Figure 4-46-3.

2. Mounting the shifter (on the back of the mechanism chassis).

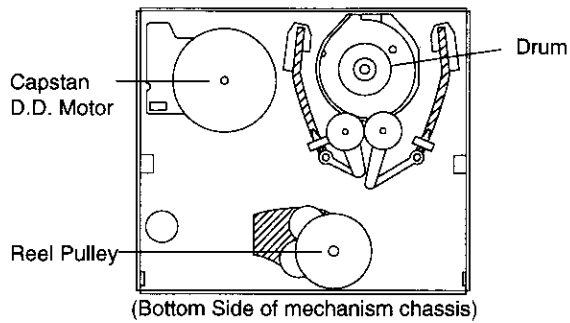


Figure 4-47.

1. Make sure that the loading gear is at the point (1) as shown below.
2. Place the shifter in position, keeping in mind the 7 insertion points and the five relief points.
3. For the phase matching at the insertion point (1), see the point (2) as shown below.
4. Finally fix the shifter with two washers located on insert points ① and ⑥.

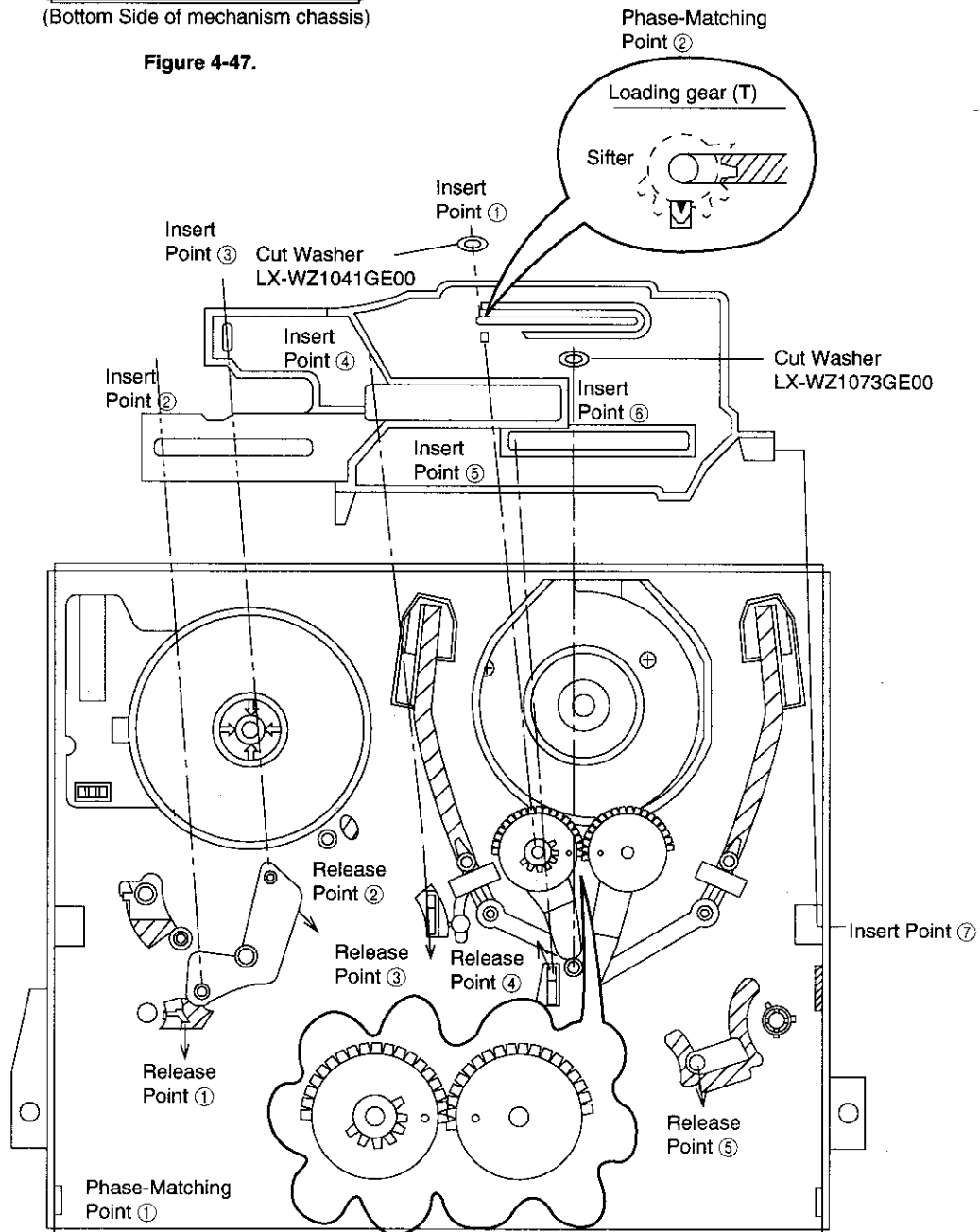


Figure 4-48.

3. Mounting the master cam (on the back of the mechanism chassis).

- (1) Make sure beforehand that the shifter is at the point as shown below.
- (2) Place the master cam in the position as shown below.

Note:

See the figure below for the phase matching between the master cam and the cassette control drive gear.
(3) Finally fix the master cam with E ring.

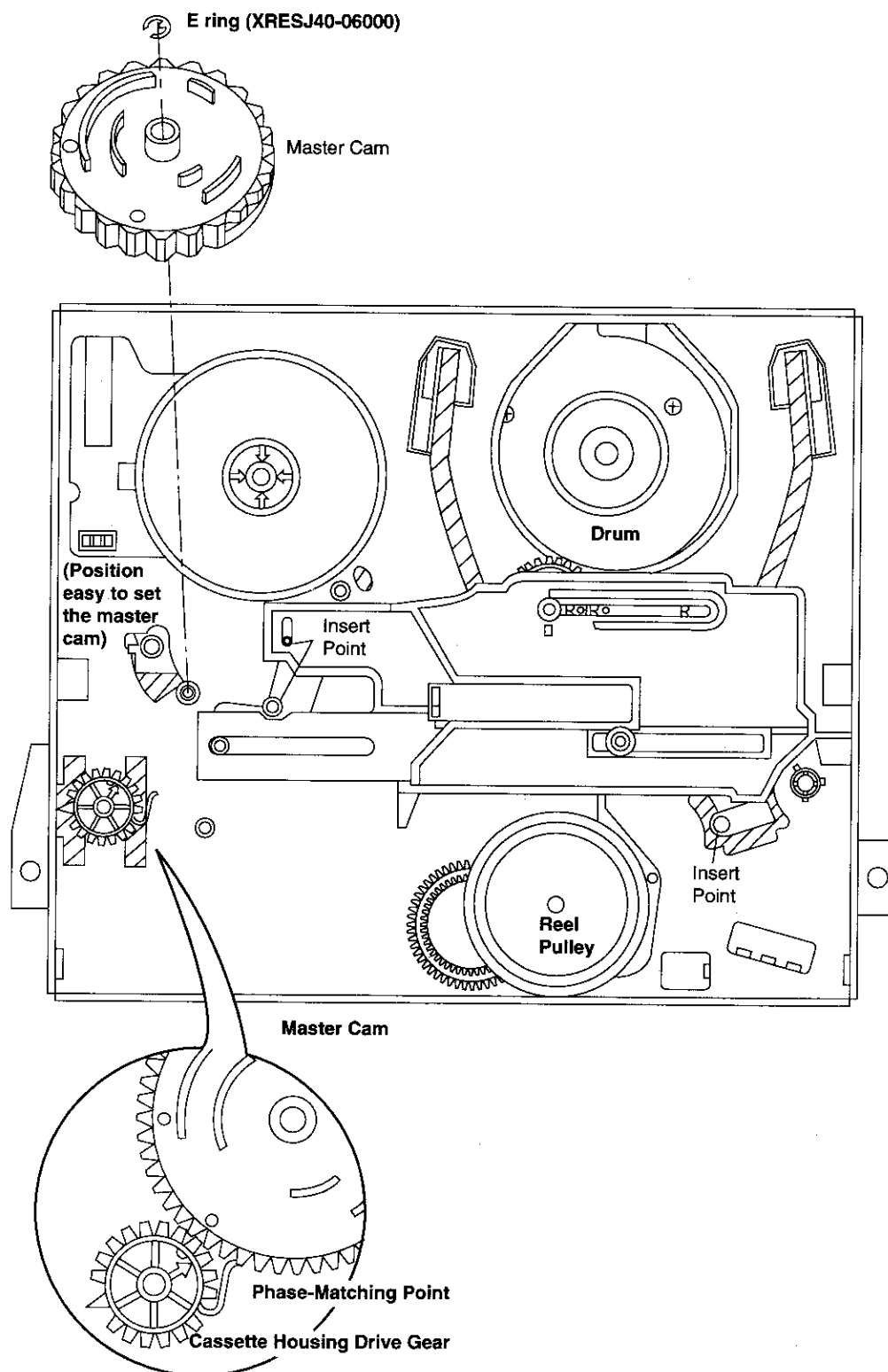


Figure 4-49.

4. Mounting the connection gear, slow brake and loading motor assemblies (on the back of the mechanism chassis).

- (1) Assemble the connect gear.
- (2) Assemble the slow brake.
- (3) Assemble the loading motor unit.

Note:

Let the slow brake leg out of the front of the mechanism chassis. Catch the spring to the take-up fixing guide that is at the left of the A/C head.

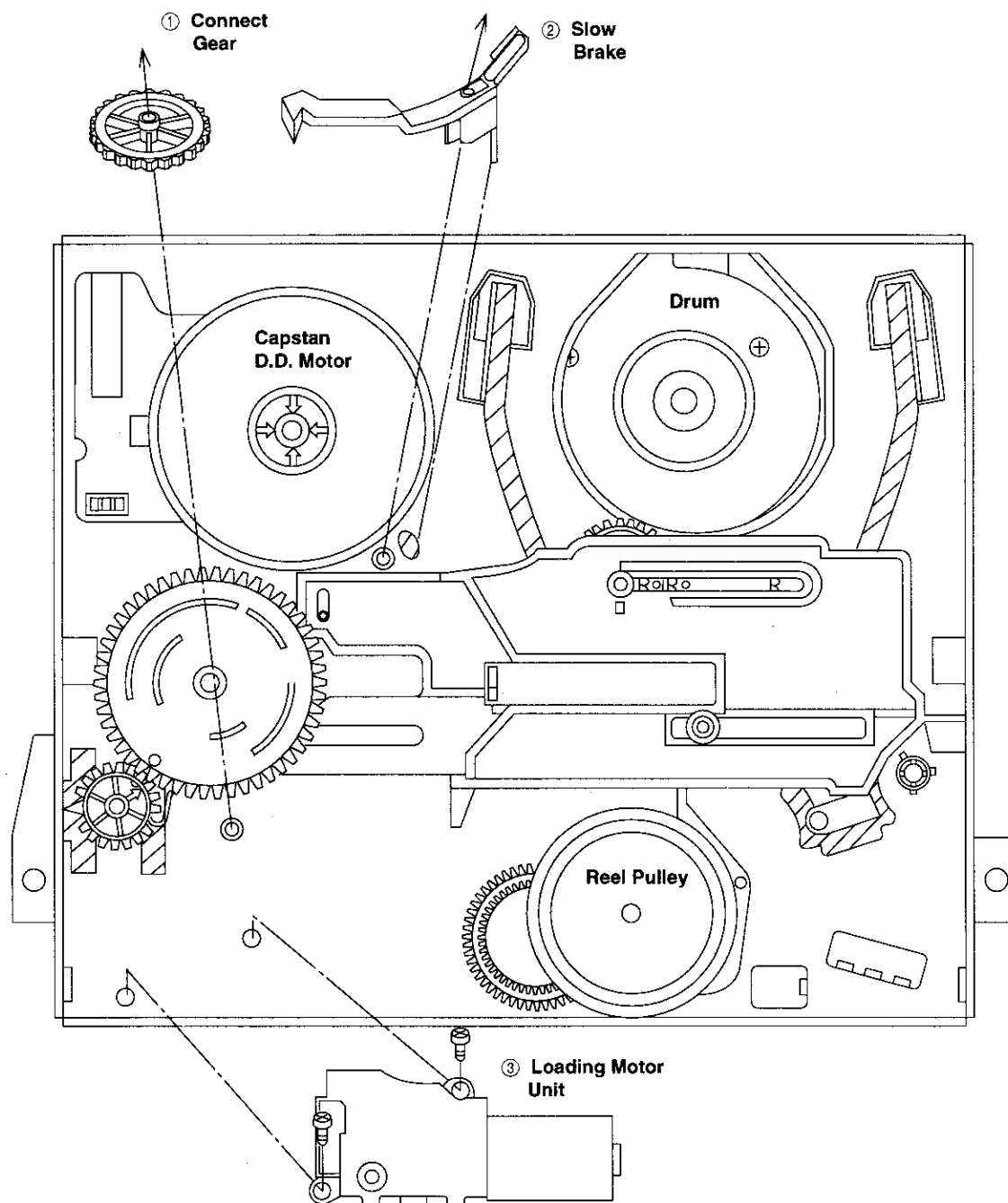


Figure 4-50.

Note:

Before setting up the loading motor, make sure the phase is matched. To do so, turn the connection gear clockwise and check to see if the loading is complete and if the pinch roller comes into contact.

When these actions are made smoothly, return the mechanism to the state as shown above. Finally mount the loading motor unit.

REPLACEMENT OF LOADING MOTOR

• Removal

Remove 2 screws.

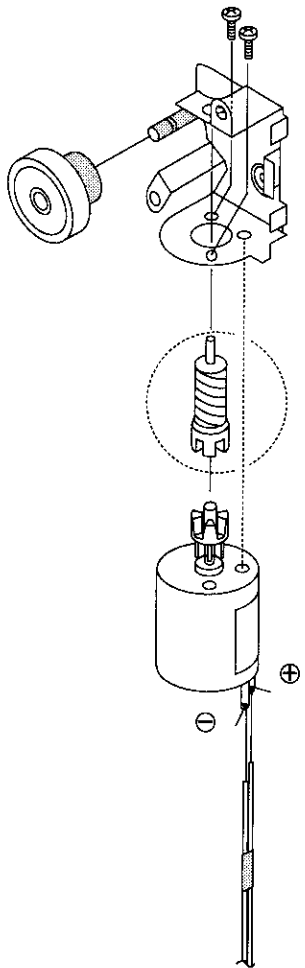


Figure 4-51.

• Replacement

- ① Take out the old loading motor. Place a replacement loading motor as shown above (Figure 4-51.).

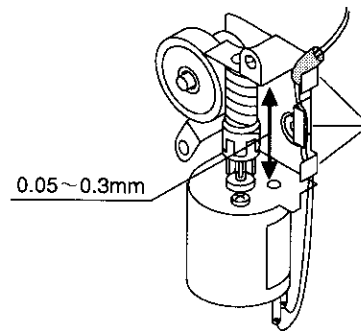
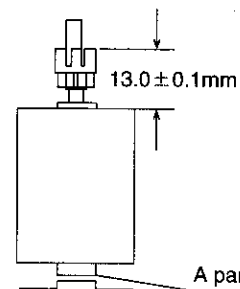


Figure 4-52.

- ② Adjust the worm gear's thrust gap to 0.05 to 0.3 mm. Use the specific washers for an appropriate thickness.



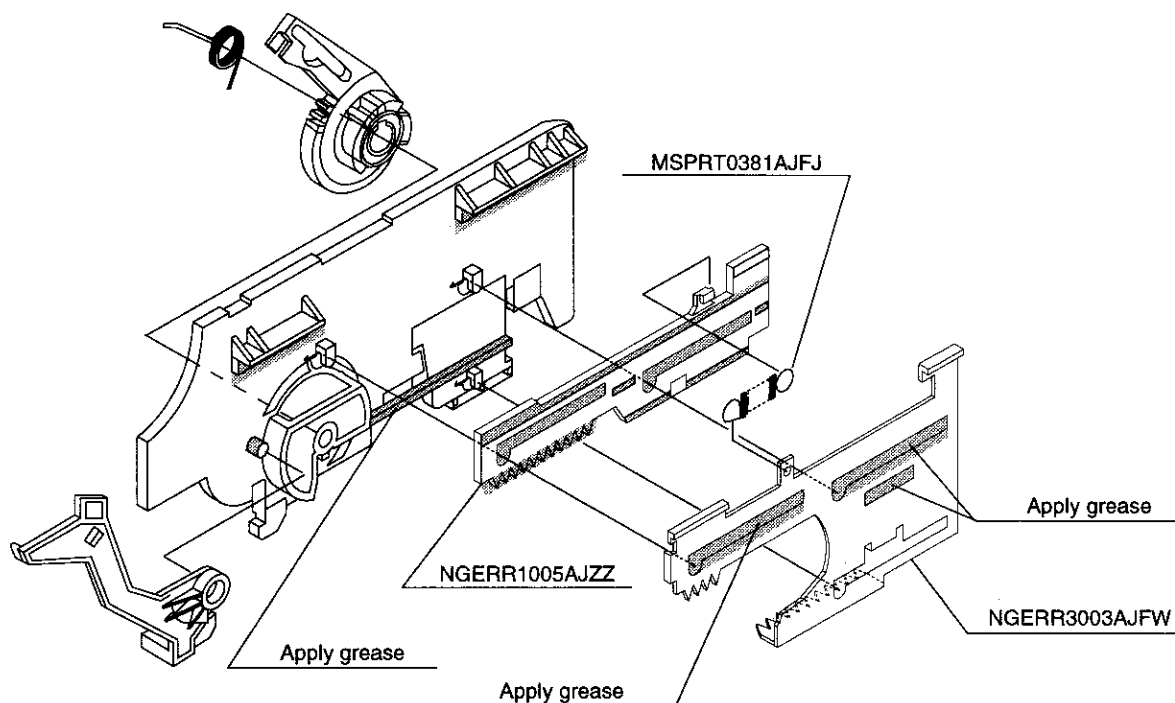
To press the motor in,
receive it by portion A.

Figure 4-53.

Press-fit the loading motor pulley with a force of less than 98N (10 kgf). Be sure that the pulley is 13.0 ± 0.1 mm away from the motor.

ASSEMBLY OF CASSETTE HOUSING

① Drive Gear R and Drive Angle Ass'y



Phase Matching Point

- Fix the drive angle ass'y to the drive gear Ras shown in the figure.

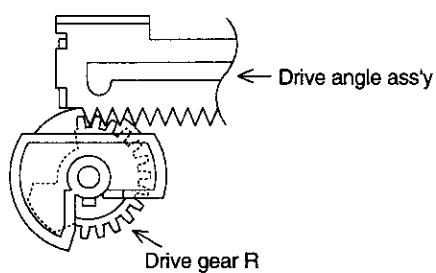


Figure 4-54.

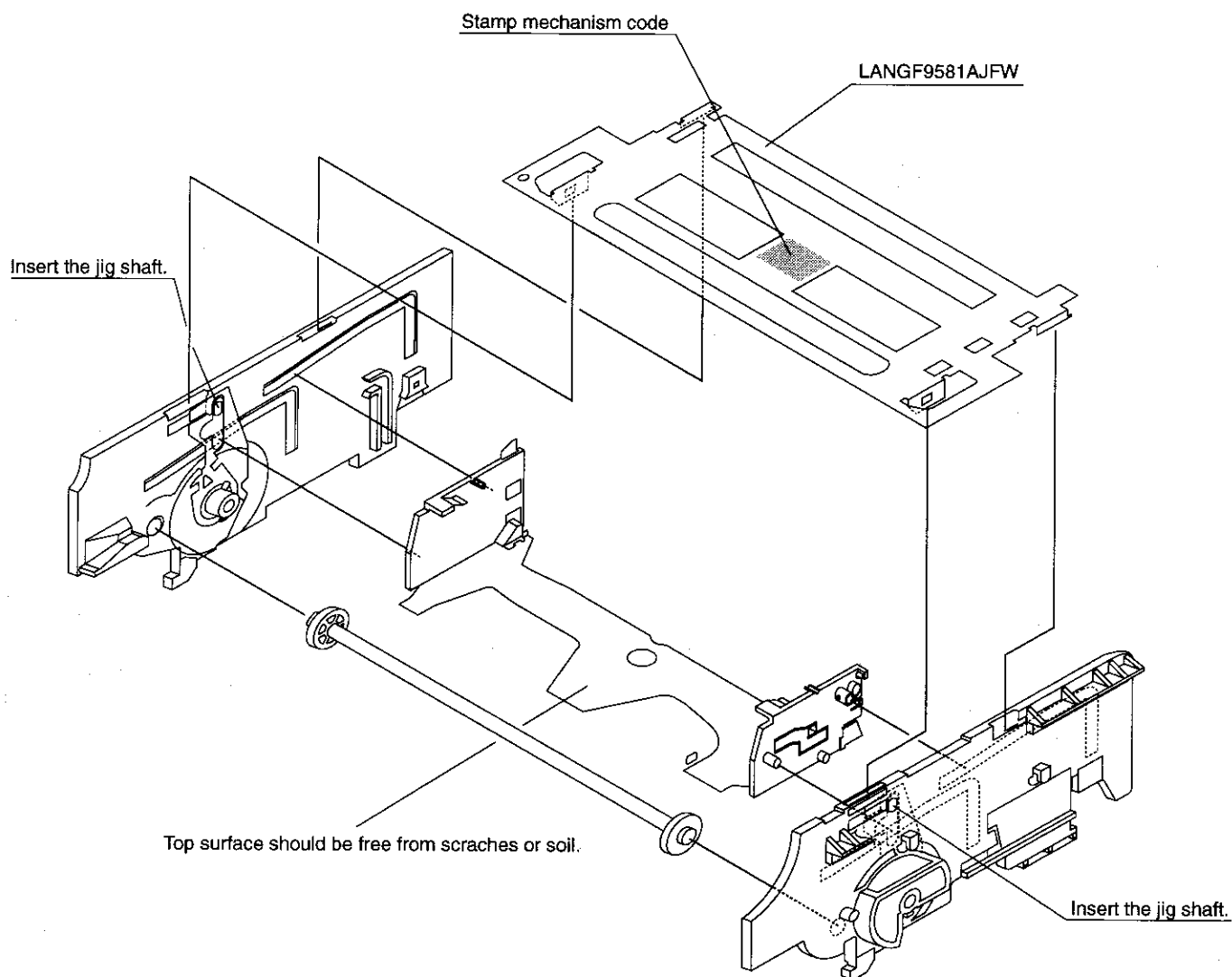


Figure 4-55.

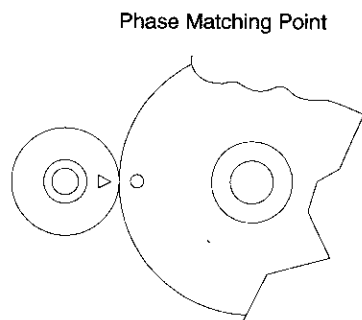


Figure 4-56.

such a case, the phase needs rematching. Align the drive gear's round hole with the synchro gear's triangular (Δ) symbol. Do this alignment for both the drive gears.

② Synchro Gear, Drive Gear L and Drive Gear R

Note:

Do not over-turn both of the drive gears when the phase has been matched. These gears are partially toothless and might come out of mesh with the synchro gear. In

5. ELECTRICAL ADJUSTMENT

Notes:

- Before the adjustment:
Electrical adjustments discussed here are often required after replacement of electronic components and mechanical parts such as video heads.
Check that the mechanism and all electric components are in good working condition prior to the adjustments, otherwise adjustments can not be completed.
- Instruments required:
 - Colour TV monitor
 - Audio signal generator
 - DC voltmeter
 - Blank video cassette tape
 - Screwdriver for adjustment
 - Colour bar signal generator
 - Dual-trace oscilloscope
 - AC milli-voltmeter
 - Frequency counter
 - Alignment tape (VROCPSV)
 - Alignment tape (VROATSV)
 - Alignment tape (VROCBFFS)

※ Servicing precautions

When the IC804 (E²PROM) has been replaced, make the following reprogramming. Depending on models, the IC804 (E²PROM) has been factory-adjusted for it's memory function.

It's therefore necessary to reprogram the memory function for the model in question.

Note that the servo circuit requires readjustments for the head switching point, slow and still modes.

- **Location of controls and test points**

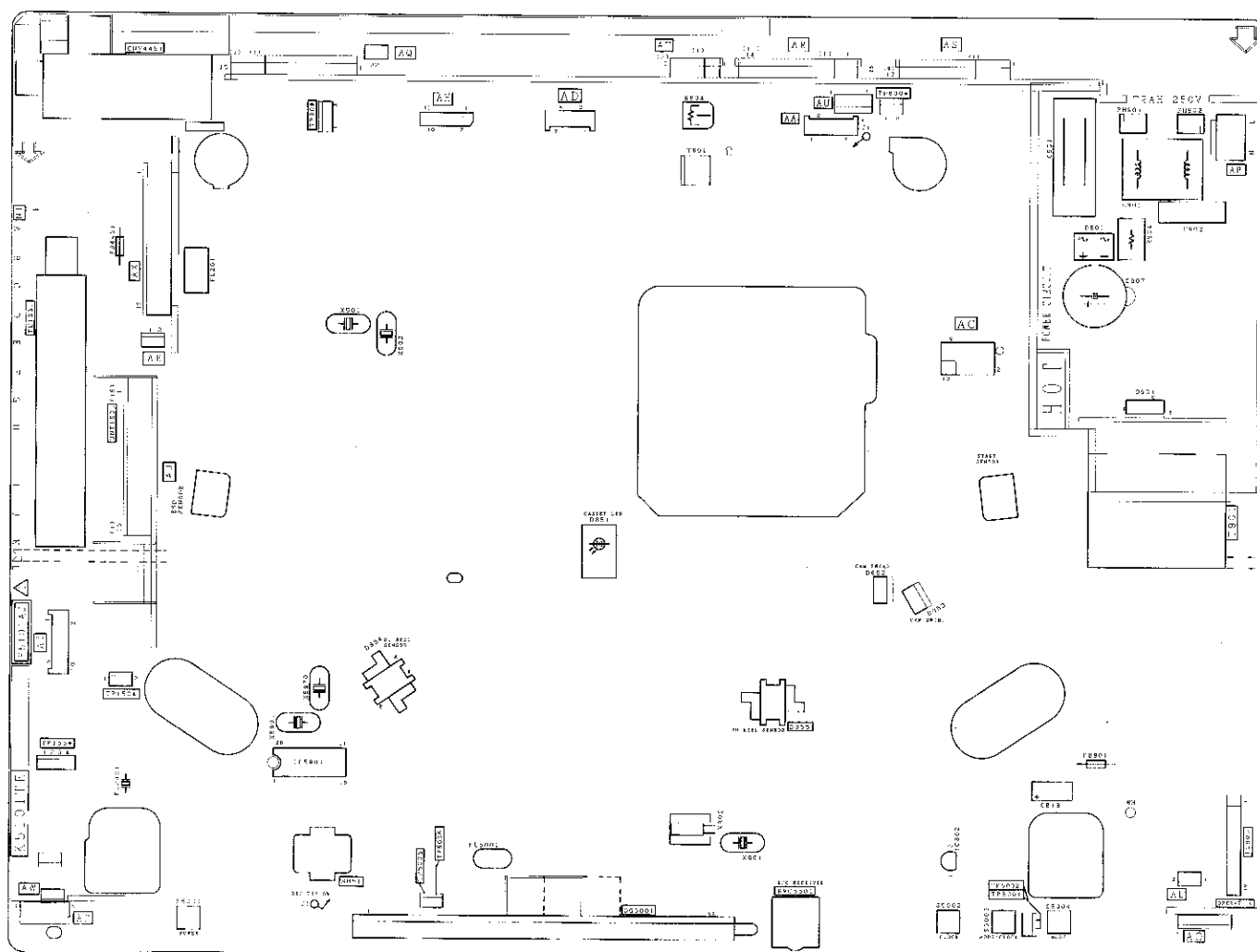


Figure 5-1.

SERVO CIRCUIT ADJUSTMENT

ADJUSTMENT OF HEAD SWITCHING POINT

Measuring instrument	Dual-trace oscilloscope Colour TV monitor
Mode	Playback
Cassette	Alignment tape (VROCPSV)
Test point	② pin of TP301 (H.S.W.P.) to CH-1, VIDEO OUT jack to CH-2 (CH-1 trigger slope switch at (+), Internal trigger at CH-1 side.)
Specification	6.5±0.5H (lines)

1. Remove the front panel and play the alignment tape. (VROCPSV)
(Playback picture on the monitor screen.)
 2. Make for a moment short-circuit between TP5001 and TP5002, both located at the front side on the main PWB.
Be sure that all the fluorescent display tubes light up into the TEST mode.
(See Note below)
 3. Press the PLAY button.
Be sure the "PLAY" appears in the fluorescent display tubes flashing (about 1Hz) into the auto PG adjustment operating.
- Note:**
When the manual PG adjustment, observe the waveform with an oscilloscope and make adjustment FF or REW button so that the specification.
4. Stop the "PLAY" appears in the flashing of fluorescent display tubes at adjusted.
 5. Press the STOP button in the return to normal mode.
 6. Make this checking of waveform on the oscilloscope screen be as shown in Figure 5-2. just after the head switching point have been adjusted.

- Note:**
- ① Set-up of TEST mode.
When the adjustment of HEAD SWITCHING POINT, AUTO TRACKING function is invalid.
 - ② When the cassette housing control ass'y is removed, set-up of mechanism operating mode.
 - 1) Replug the AC power cord it a few minutes later.
 - 2) Make a short-circuit between TP5005 and TP5006, both located at the front side on the main PWB with a 22 ohm resistor, to center the tracking.
 - 3) AC power cord is plugged in.
 - 4) You can mechanism operatig mode, Replug the AC power cord a few minutes later.

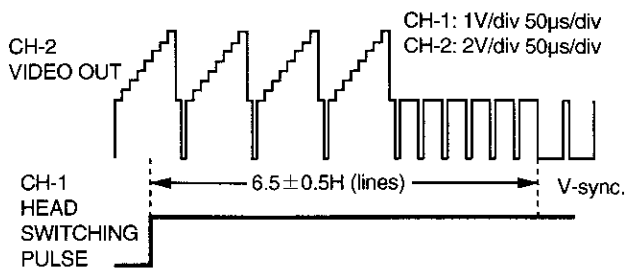


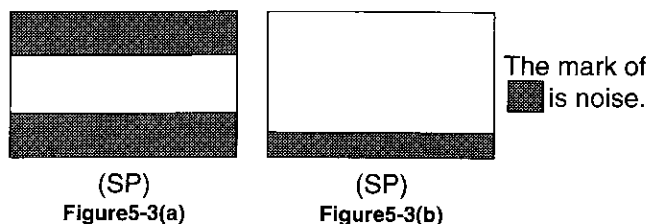
Figure 5-2.

ADJUSTMENT OF SLOW TRACKING PRE-SET (2 HEAD MODELS)

Measuring instrument	Colour TV monitor
Mode	Playback
Cassette	Self-recorded tape (See Note below)
Control	Tracking control buttons (+) or (-)
Specification	Reference of following step 6.

1. Have the unit to receive a good TV broadcast or feed a video signal to the VIDEO IN jack. (See note ② below)
2. Set the tape speed in SP mode by using the remote control and record the signal on tape.
3. Rewind and play the tape where signal was recorded in above step.
4. Press the SLOW button on the remote control, and playback the recorded portion in the slow mode.
5. Make for a moment short-ciucuit between TP5001 and TP5002, both located at the front side on the main PWB.
Be sure that all the fluorescent display tubes light up into the TEST mode.
6. Look at the monitor screen and adjust the (+) or (-) TRACKING buttons so that the position of noise come following Figure5-3(a) and(b).
7. Press the STOP button to return to normal mode.
8. Play the tape a few seconds then press the SLOW button again and make sure there is no noise in the screen.
(For the LP mode put adjustment at the same adjustment way as SP mode.)

- Notes:**
- ① Self-recorded tape means a cassette whose program was recorded by the unit being adjusted.
 - ② The TV program will not be recorded if RCA or 21pin plugs are plugged in to the AUDIO/VIDEO input terminals.



ADJUSTMENT OF SP/LP SLOW TRACKING PRESET (4 HEAD MODELS)

Measuring instrument	Colour TV monitor
Mode	Playback
Cassette	Self-recorded tape (SP/LP mode) (See Note below)
Control	Tracking control buttons (+) or (-)
Specification	Minimized noise on monitor screen

1. Have the unit to receive a good TV broadcast or feed a video signal to the VIDEO IN jack. (See note ② below)
2. Set the tape speed in SP mode by using the remote control and record the signal on tape.
3. Rewind and play the tape where signal was recorded in above step.
4. Press the SLOW button on the remote control, and playback the recorded portion in the slow mode.
5. Make for a moment short-circuit between TP5001 and TP5002, both located at the front side on the main PWB.
Be sure that all the fluorescent display tubes light up into the TEST mode.
6. Look at the monitor screen and adjust the (+) or (-) TRACKING buttons so that the there is noise disappears from the screen.
7. Press the STOP button to return to normal mode.
8. Play the tape a few seconds then press the SLOW button again and make sure there is no noise in the screen.
(For the LP mode put adjustment at the same adjustment way as SP mode.)

Notes:

- ① Self-recorded tape means a cassette whose program was recorded by the unit being adjusted.
- ② The TV program will not be recorded if RCA or 21pin plugs are plugged in to the AUDIO/VIDEO input terminals.

ADJUSTMENT OF FV (False Vertical Sync) OF STILL PICTURE (2 HEAD MODELS)

Measuring instrument	Colour TV monitor
Mode	Playback still
Cassette	Self-recorded tape (See Note below ②)
Control	Tracking control buttons (+) or (-)
Specification	No vertical jitter of picture

1. Play a cassette which was recorded.
2. Press the PAUSE/STILL button to freeze the picture.
3. Look at the monitor screen and adjust (+) or (-) TRACKING buttons so that the vertical jitter of the picture to be minimized.
4. Play and freeze the self-recorded tape and make sure vertical jitter of the picture is not noticeable.
(For the LP mode put adjustment at the same adjustment way as SP mode)

Note:

- ① The FV goes back to the it's initial state when the unit is put into the system controller reset mode due to power failure, etc.
In this case, preset the FV once again.
- ② Self-recorded tape is a cassette whose program was recorded by the unit being adjusted.

ADJUSTMENT OF FV(False Vertical Sync) OF STILL PICTURE (4 HEAD MODELS)

Measuring instrument	Colour TV monitor
Mode	Playback still
Cassette	Self-recorded tape (SP mode) (See Note below ②)
Control	Tracking control buttons (+) or (-)
Specification	No vertical jitter of picture

1. Play a cassette which was recorded by the unit in SP mode.
2. Press the PAUSE/STILL button to freeze the picture.
3. Look at the monitor screen and adjust (+) or (-) TRACKING buttons so that the vertical jitter of the picture to be minimized.
4. Play and freeze the self-recorded tape in SP mode and make sure vertical jitter of the picture is not noticeable.
(For the LP mode put adjustment at the same adjustment way as SP mode.)

Note:

- ① The FV goes back to the it's initial state when the unit is put into the system controller reset mode due to power failure, etc.
In this case, preset the FV once again.
- ② Self-recorded tape is a cassette whose program was recorded by the unit being adjusted.

Y/C CIRCUIT ADJUSTMENT

CHECKING OF VIDEO E-E LEVEL

Measuring instrument	Oscilloscope
Mode	E-E or Record
Input signal	EIA colour bar (1.0Vp-p)
Test point	VIDEO OUT jack
Specification	$1.0 \pm 0.1\text{Vp-p}$

1. Connect a 75 ohm terminating resistor to the VIDEO OUT jack and connect an oscilloscope across this terminating resistor.
(See Note below.)
2. Feed a colour bar signal to the VIDEO IN jack.
3. Make sure that the E-E signal amplitude is 1.0Vp-p as shown in Figure 5-3.

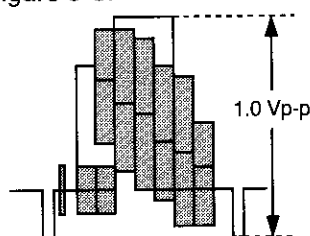


Figure 5-3.

Notes:

If the 75 ohm terminating resistor is missing, the signal amplitude will be doubled.

CHECKING OF WHITE CLIP LEVEL

Measuring instrument	Oscilloscope
Mode	E-E or Record
Input signal	EIA colour bar (1.0Vp-p)
Test point	Pin(48) of IC401, GND
Specification	$190 \pm 5\%$ (See note below)

1. Connect a oscilloscope to pin(48) of IC401 and GND.
2. Feed the colour bar signal to the VIDEO IN jack and set the unit in E-E or recording mode.
3. Make sure that the overshoot of the video signal is clipped at 190% as shown in Figure 5-4.

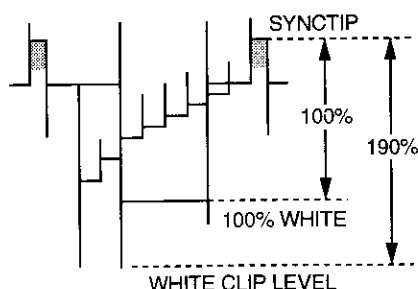


Figure 5-4.

Note:

From sync tip to white peak, the level is 100%.
The white clip level is 90% above the white level.

CHECKING OF RECORD LEVEL

Measuring instrument	Dual-trace oscilloscope
Mode	Record mode
Input signal	EIA colour bar (1.0Vp-p)
Test point	Chroma (Red) R515 terminal lead at L509 side (Sig.) ~ GND Sync tip R226 terminal lead at L210 side (Sig.) ~ GND
Specification	Chroma (Red): 205~290mVp-p Sync tip: 360~440mVp-p

1. Feed the colour bar signal to the VIDEO IN jack and set the unit in recording mode.
2. Connect a dual-trace oscilloscope to each test point shown in table.
3. Make sure so that the amplitude of the chrome (Red) portion and the sync tip portion are specified as shown in Figure 5-5

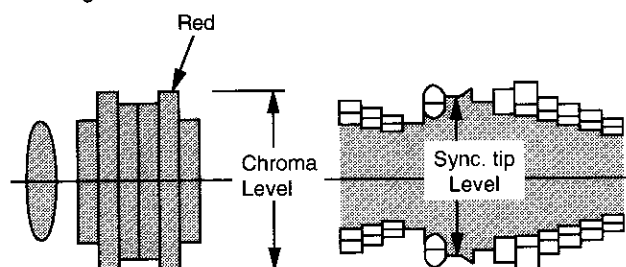


Figure 5-5 (a).

Figure 5-5 (b).

CHECKING OF PLAYBACK LEVEL

Measuring instrument	Oscilloscope
Mode	Record/Playback
Input signal	EIA colour bar (1.0Vp-p)
Test point	VIDEO OUT jack
Specification	$1.0 \pm 0.1 \text{ Vp-p}$

1. Be sure that E-E level has been correctly specified.
2. Connect a 75 ohm terminating resistor to the VIDEO OUT jack and connect an oscilloscope across this terminating resistor.
(See Note below.)
3. Feed a colour bar signal to the VIDEO IN jack and set the unit in recording mode.
4. Play the colour bar portion of the recorded tape.
5. Make sure that the output signal amplitude is 1.0Vp-p as shown in Figure 5-6.

Note:

If the 75 ohm terminating resistor is missing, the signal amplitude will be doubled.

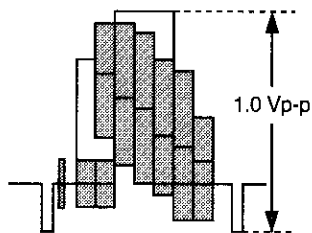


Figure 5-6.

AUDIO CIRCUIT

CHECKING OF E-E LEVEL

Measuring instrument	AC milli-voltmeter
Mode	E-E/Record
Input signal	1kHz, -8.0dBs (at RCA type jack) 1kHz, -3.8dBs (at 21pin type jack)
Test point	AUDIO OUT jack
Specification	-8.0±2dBs (at RCA type jack) -3.8±2dBs (at 21pin type jack)

1. Connect an oscilloscope to the AUDIO OUT jack.
2. Feed the audio signal shown in table to the AUDIO IN jack.
3. Put the unit in E-E or recording mode.
4. Make sure that the output level is value shown in table.

CHECKING OF AUDIO PLAYBACK LEVEL

Measuring instrument	AC milli-voltmeter
Mode	Playback
Input signal	Alignment tape.(VROCPSV)(1kHz level control signal.)
Test point	AUDIO OUT jack
Specification	-9 ^{+2dB} _{-1dB}

1. Playback the Alignment tape. (VROCPSV 1kHz level audio signal)
2. Connect an AC milli-voltmeter to the AUDIO OUT jack.
3. Make sure that the output level is value shown in table.

CHECKING OF AUDIO RECORD LEVEL

Measuring instrument	AC milli-voltmeter
Mode	Record/playback
Input signal	1kHz, -8.0dBs (at RCA type jack) 1kHz, -3.8dBs (at 21pin type jack)
Test point	AUDIO OUT jack
Specification	-8.0±3dBs (at RCA type jack) -3.8±3dBs (at 21pin type jack)

1. Connect an oscilloscope to the AUDIO OUT jack.
2. Feed the audio signal shown in table to the AUDIO IN jack.
3. Make the self-recording and playback of the signal.
4. Make sure that the output level is value shown in table. If it's out of specified value, verify the bias current (CHECKING OF AUDIO BIAS CURRENT below).

CHECKING OF AUDIO BIAS CURRENT

Measuring instrument	AC milli-voltmeter
Mode	Record
Input signal	Not required
Test point	TP601 (+) ~ TP602 (-)
Specification	2.5±0.1mVrms

1. Connect an AC milli-voltmeter to TP601 (+) and TP602 (-).
(Use TP602 for ground lead.)
2. Put the unit in recording mode.
3. Make sure that the AC milli-voltmeter reads 2.5±0.1mVrms.

CHECKING OF ERASE VOLTAGE AND OSCILLATION FREQUENCY

Measuring instrument	Oscilloscope
Mode	Record
Test point	Full erase head
Control	T601
Specification	70±5kHz, 40Vp-p or greater

1. Put the unit in recording mode.
2. Connect an oscilloscope across the full erase head.
3. Make sure the erase voltage across the full erase head is approx. 40Vp-p or more and frequency is 70±5kHz.

RF CIRCUIT

ADJUSTMENT OF RF AGC CIRCUIT

Measuring instrument	DC voltmeter and VHF signal generator
Mode	RF signal at E69-CH (by VHF signal generator) (EBU colour bar signal at 87.5% modulated.)
Test point	TP1552 (Sig.) TP1554 (GND)
Control	VR001 AGC control
Specification	$5.6 \pm 0.1V$

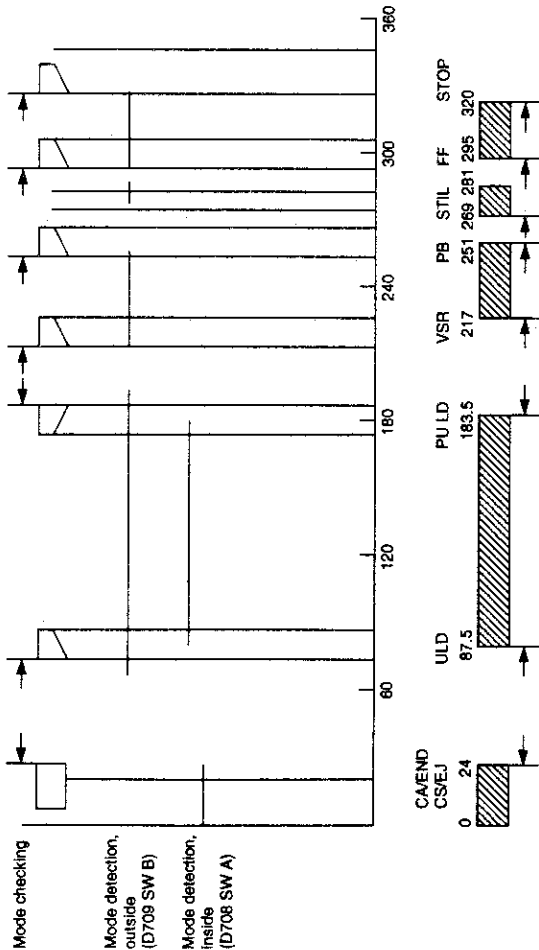
1. Receive the E69 channel signal(colour bar signal at 87.5% modulated.) at Input field strength: 53dB μ V of antenna terminal.
2. Connect a DC voltmeter to test points shown in table.
3. Adjust VR001 (AGC control) in the IF pack so that the voltage be specified.

6. MECHANISM OPERATION FLOWCHART AND TROUBLESHOOTING GUIDE

MECHANISM OPERATION FLOWCHART

* This flowchart describes the outline of the mechanism's operation, but does not give its details.

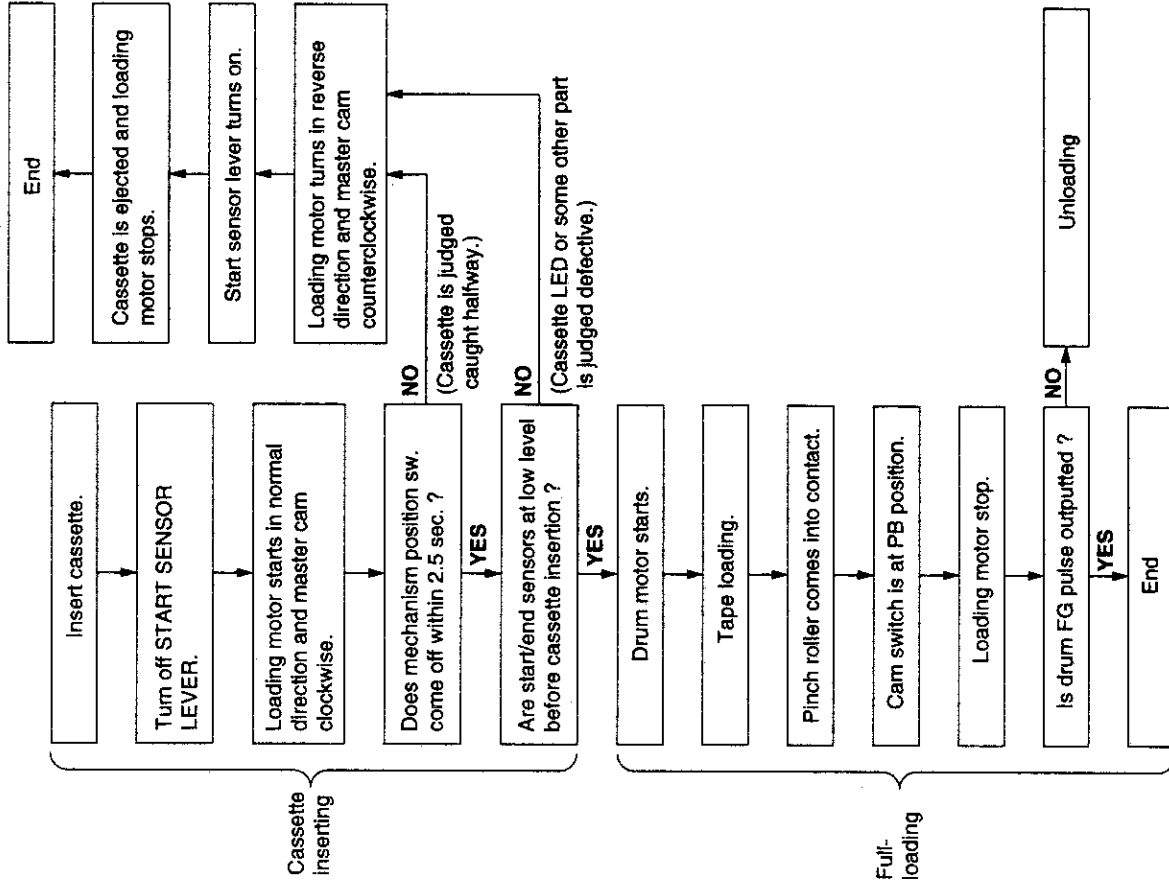
Cam movement chart



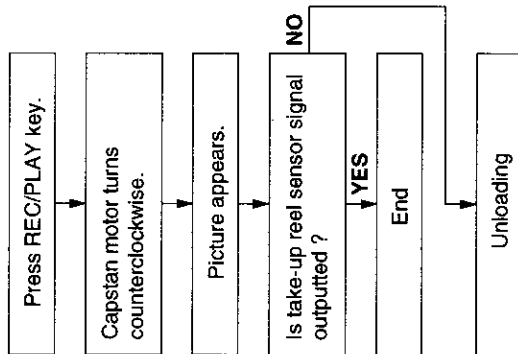
	CS/EJ	UL/D	PU/LD	VSR	PB	STL	FF	STOP
Mode detection, outside (D709 SW B)	0	0	0	1	1	0	0	1
Mode detection, inside (D708 SW A)	1	0	0	0	1	0	0	0
S sensor	1	1	0	1	1	0	0	0

start sensor open close

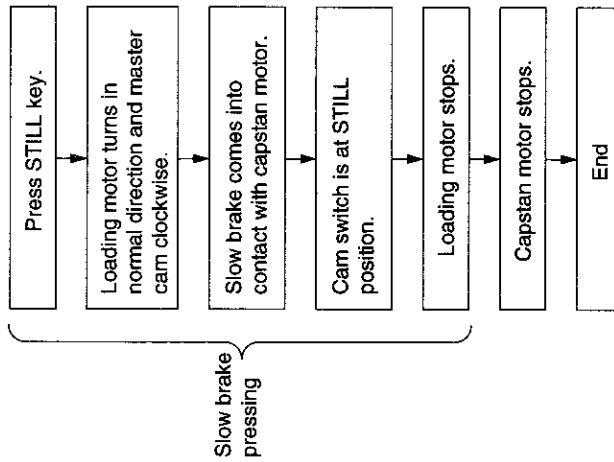
CASSETTE INSERTION → STOP



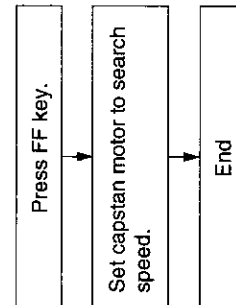
STOP → REC/PLAY



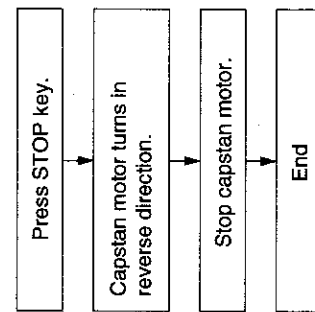
PLAY → STILL



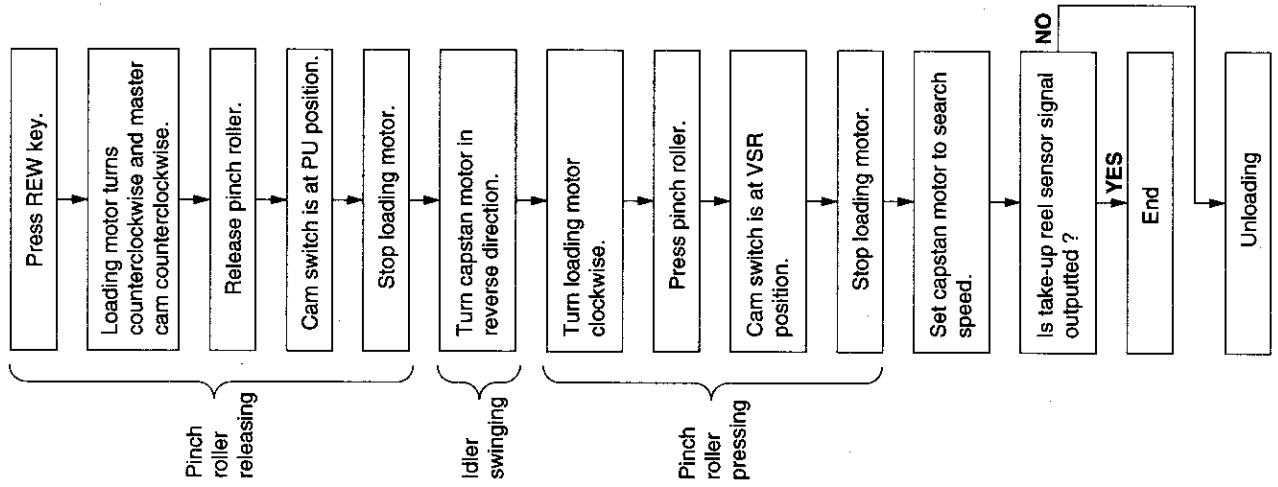
PLAY → VSF



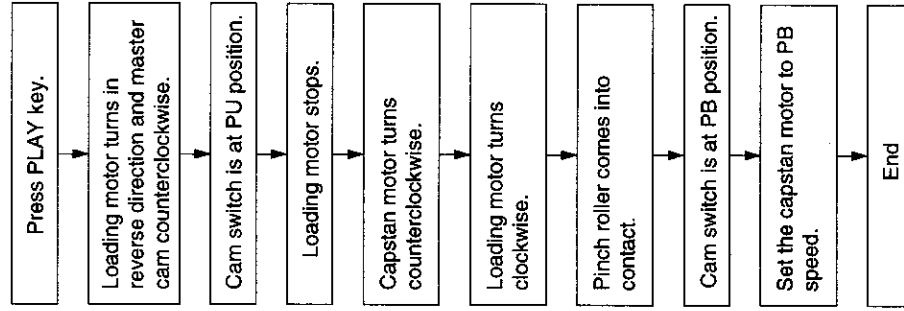
REC/PLAY → STOP



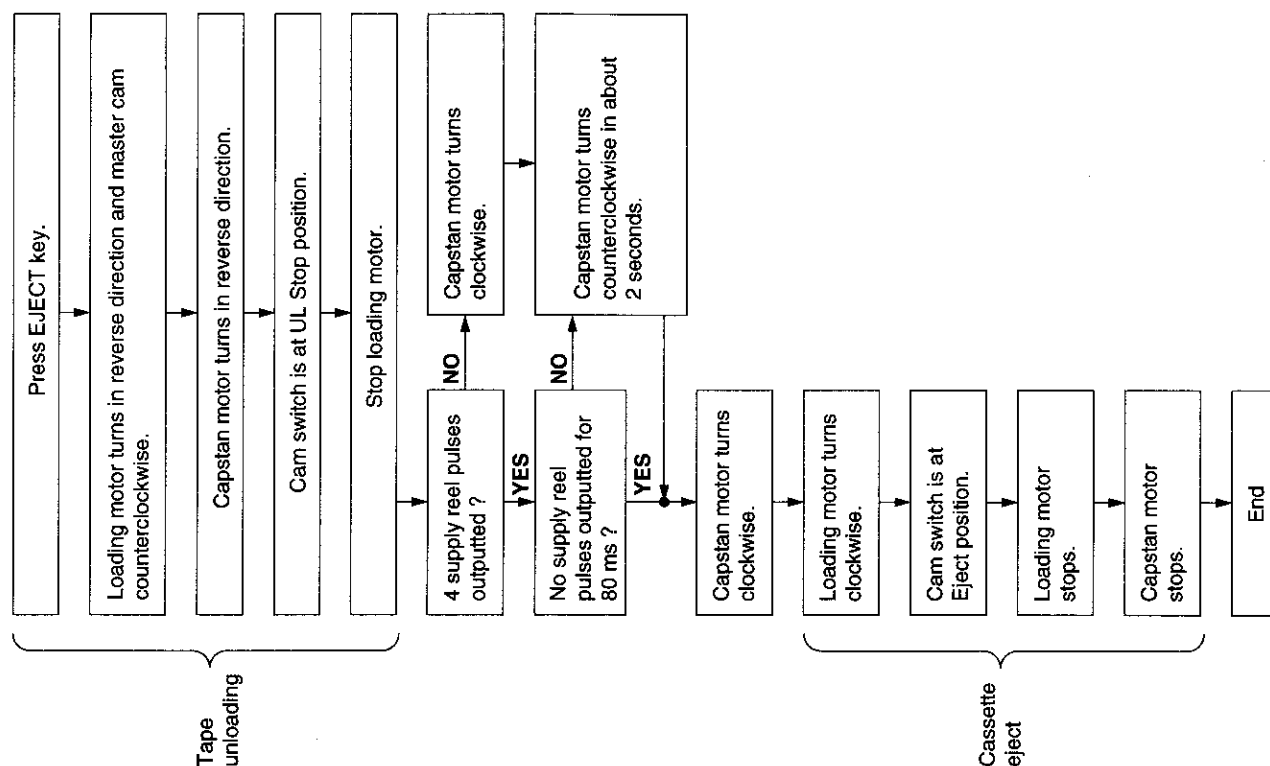
PLAY → VSR



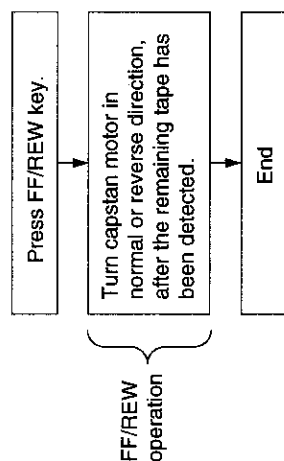
VSR → PLAY



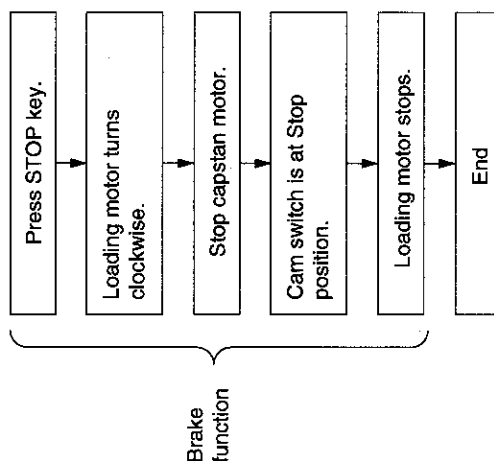
STOP → CASSETTE EJECT



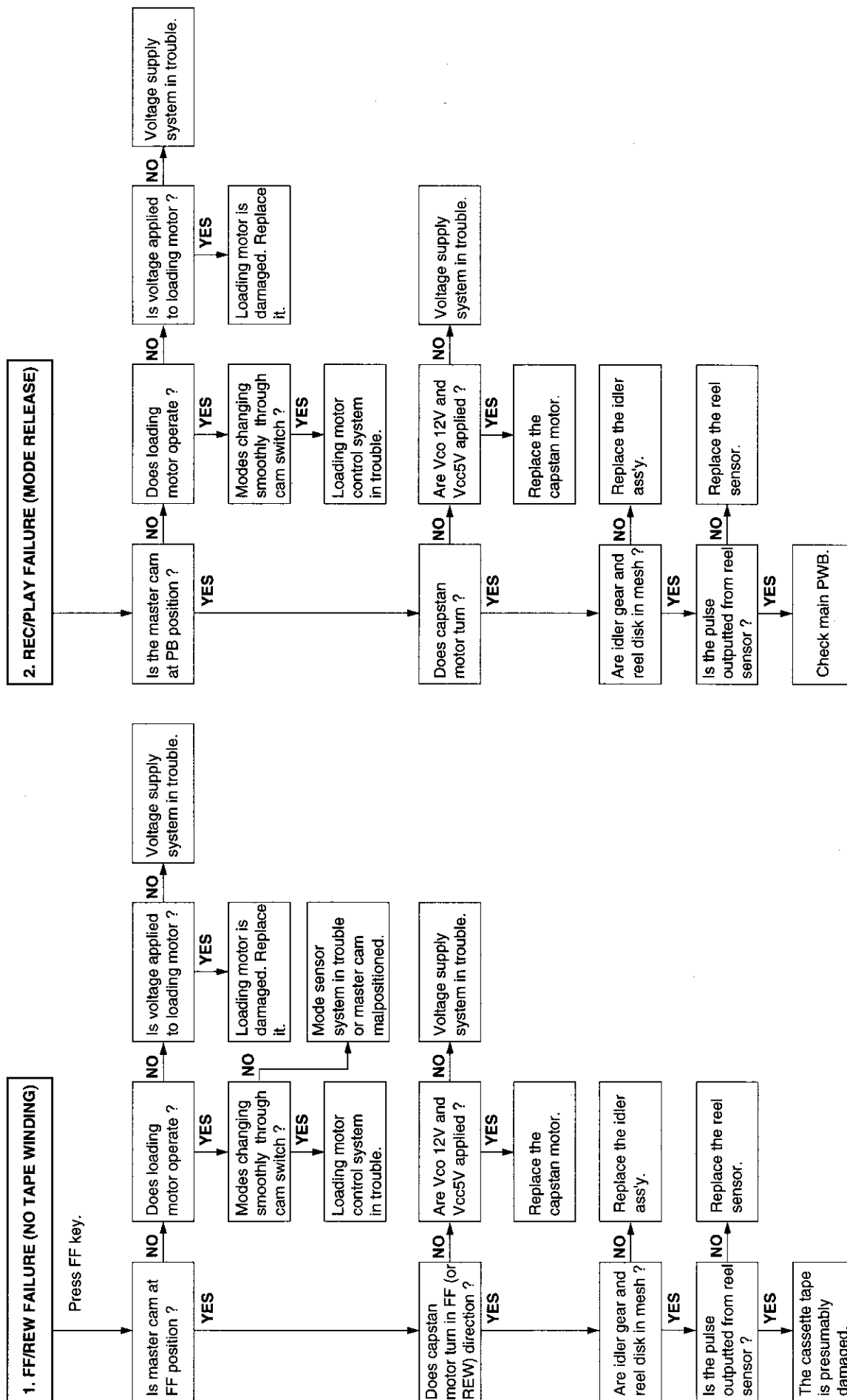
STOP → FF/REW

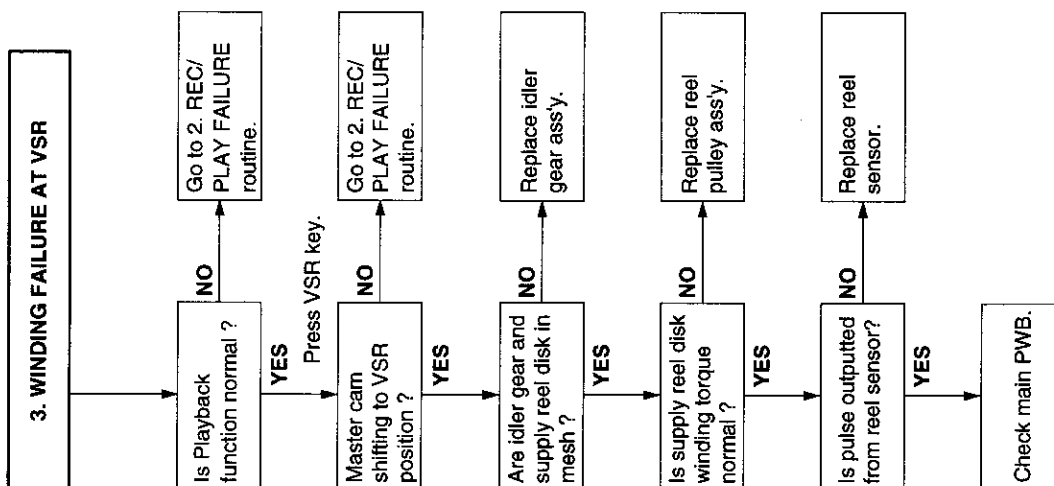
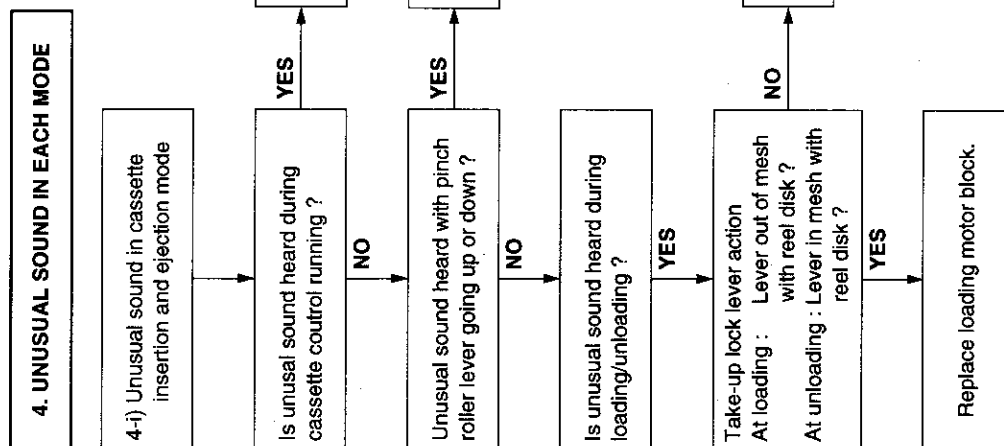


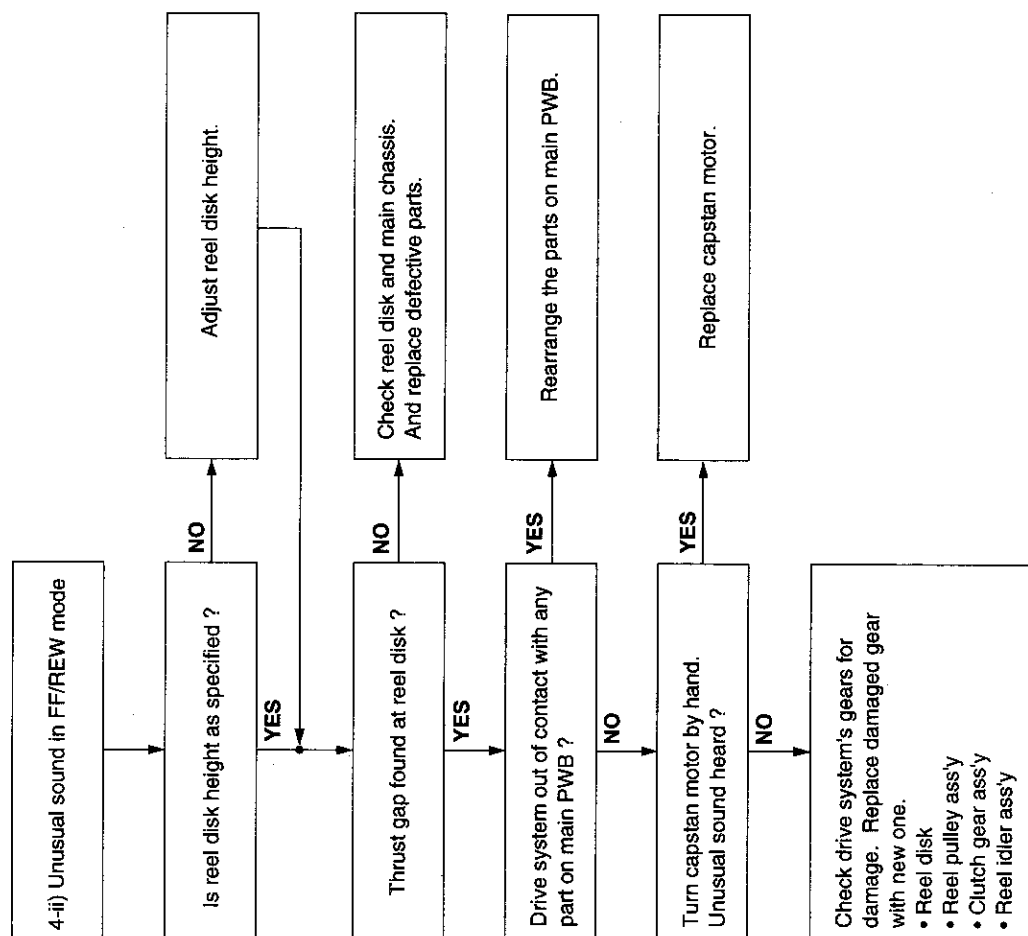
FF/REW → STOP



MECHANISM TROUBLESHOOTING

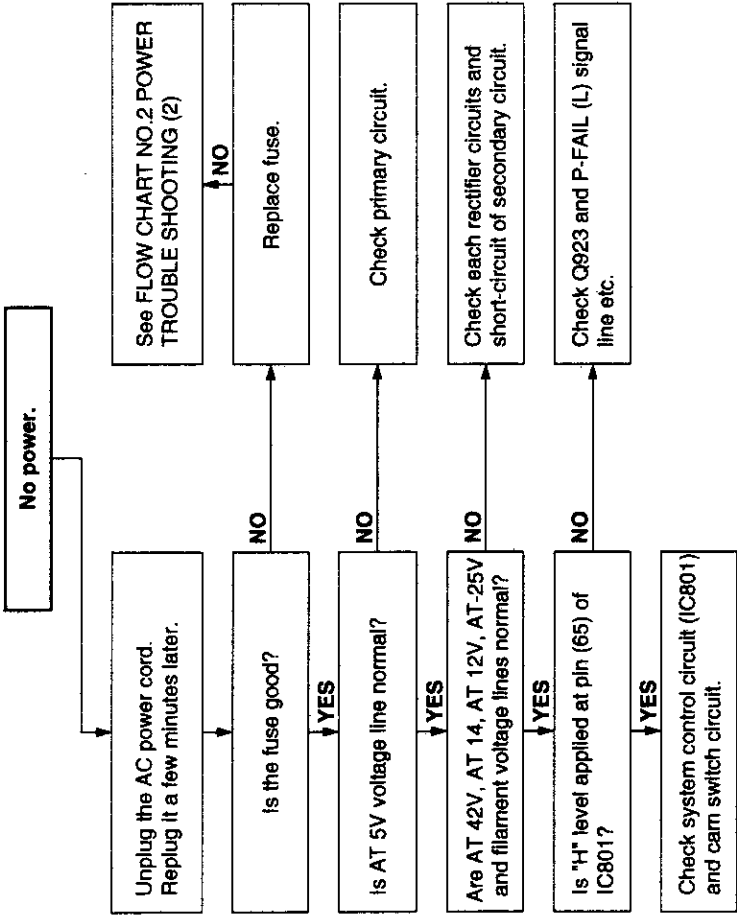




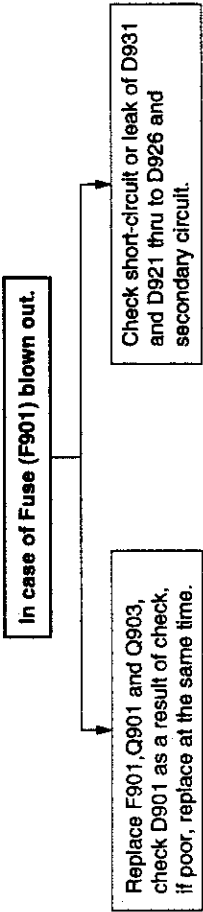


7. TROUBLESHOOTING

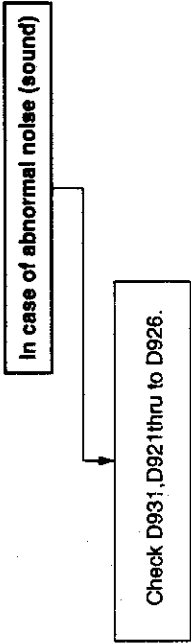
FLOW CHART NO.1 POWER TROUBLESHOOTING (1)



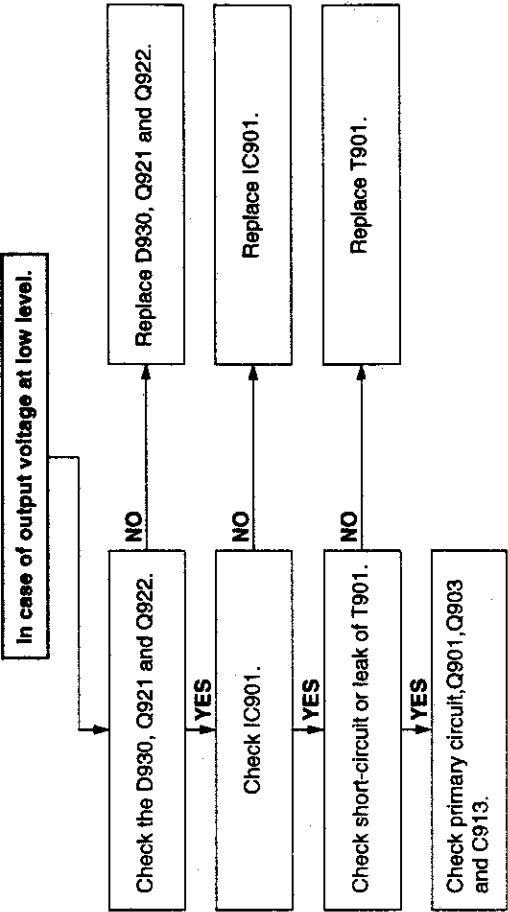
FLOW CHART NO.2 POWER TROUBLESHOOTING (2)



FLOW CHART NO.3 POWER TROUBLESHOOTING (3)

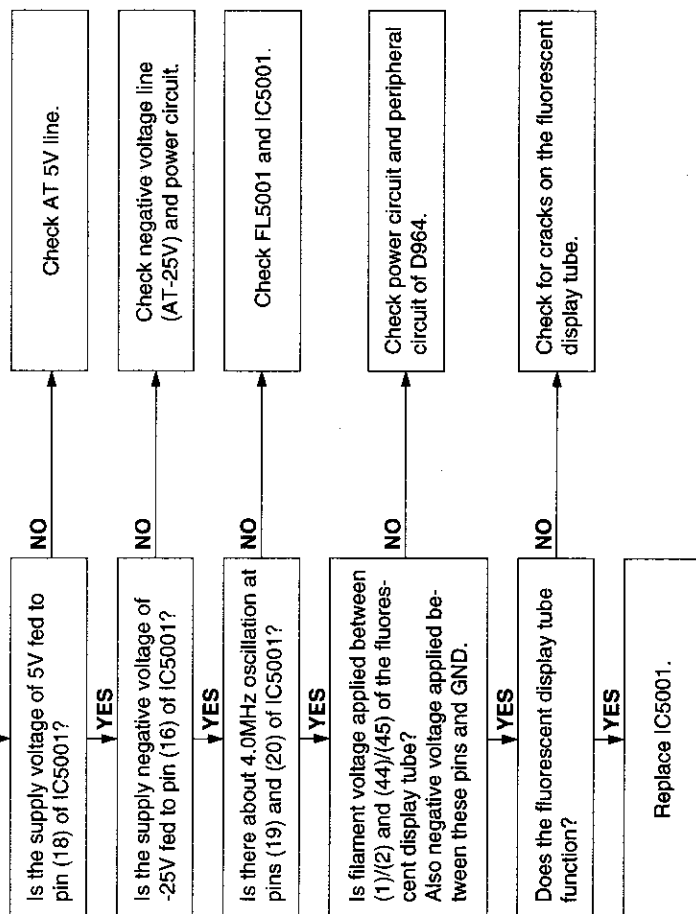


FLOW CHART NO.4 POWER TROUBLESHOOTING (4)



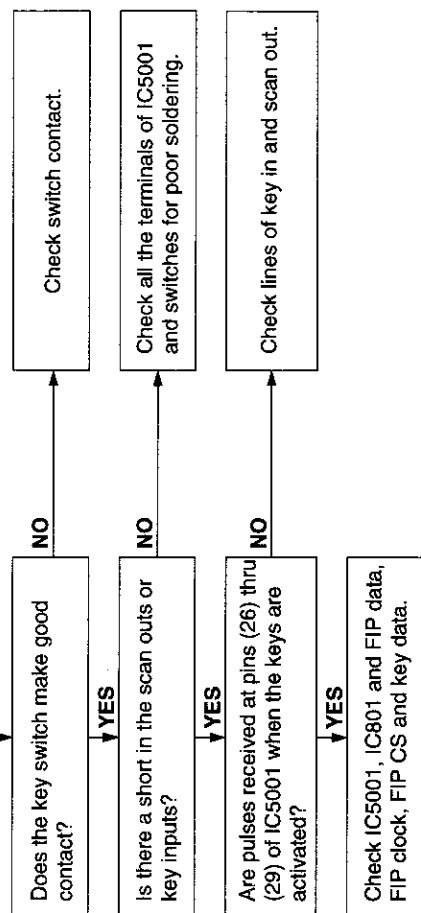
FLOW CHART NO.5 TIMER (1) TROUBLESHOOTING

The fluorescent display tube fails light up.



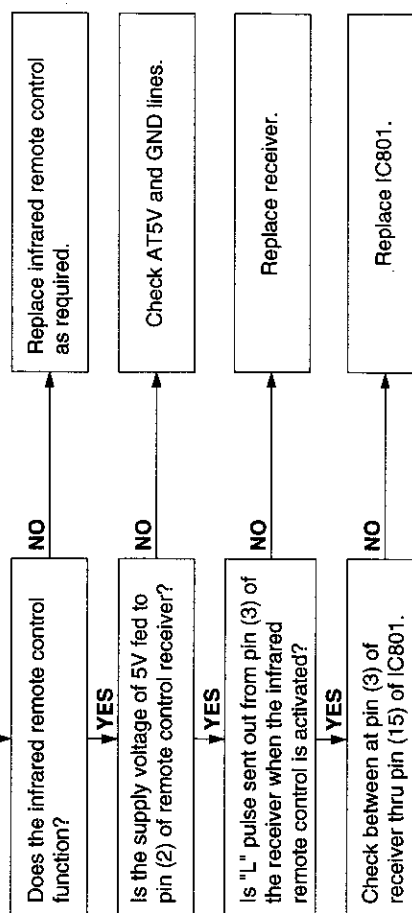
FLOW CHART NO.6 TIMER (2) TROUBLESHOOTING

Key-in input is not received.

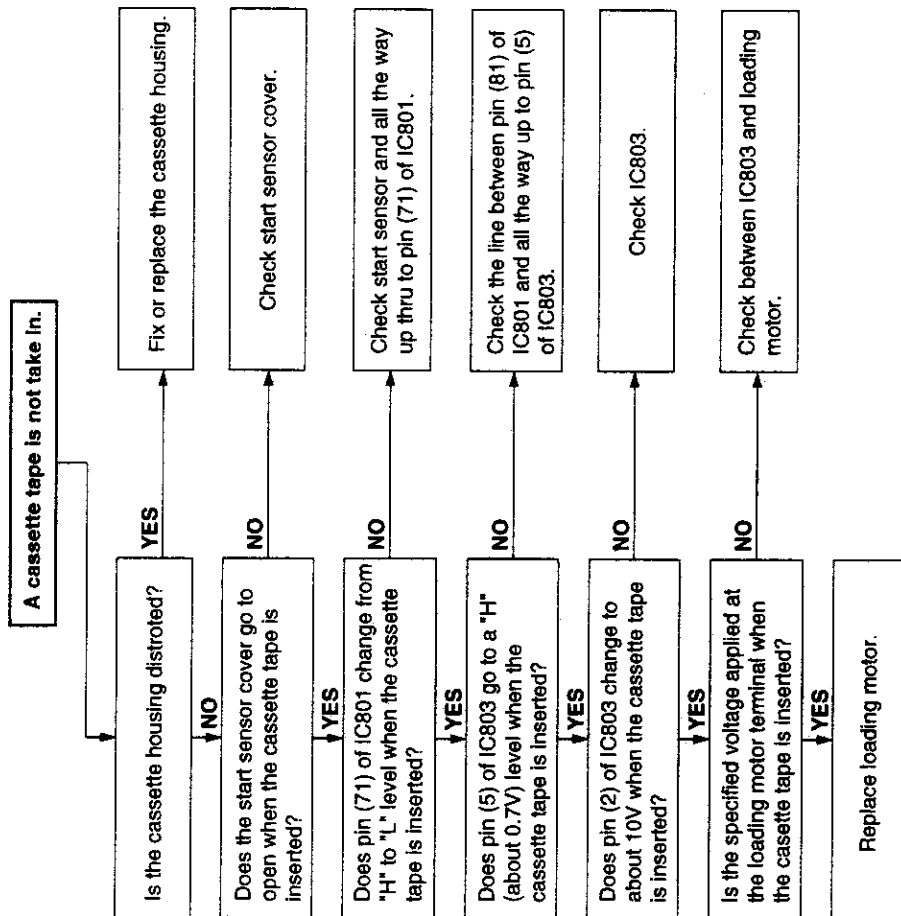


FLOW CHART NO.7 INFRARED R/C TROUBLESHOOTING

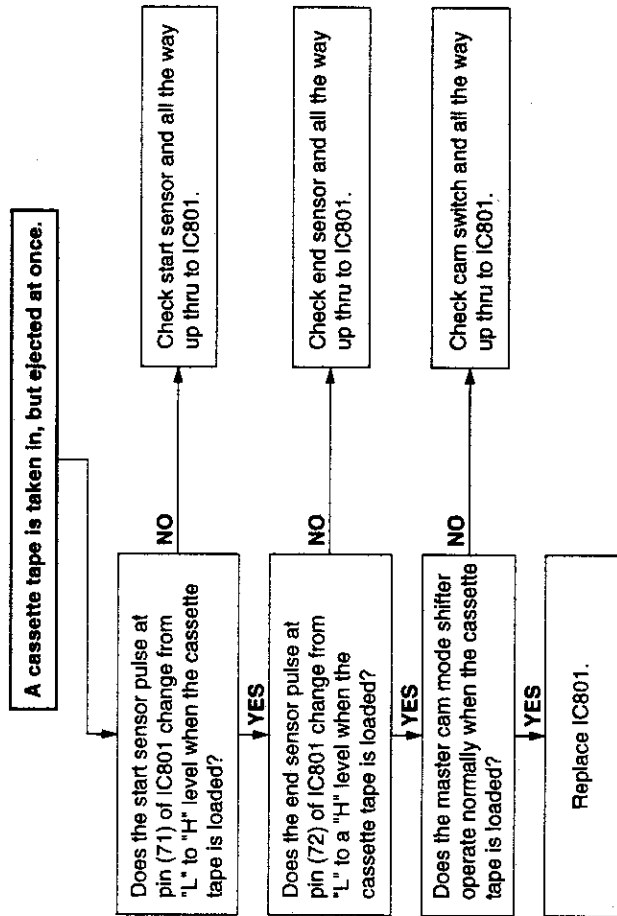
No operation is possible from the infrared remote control.



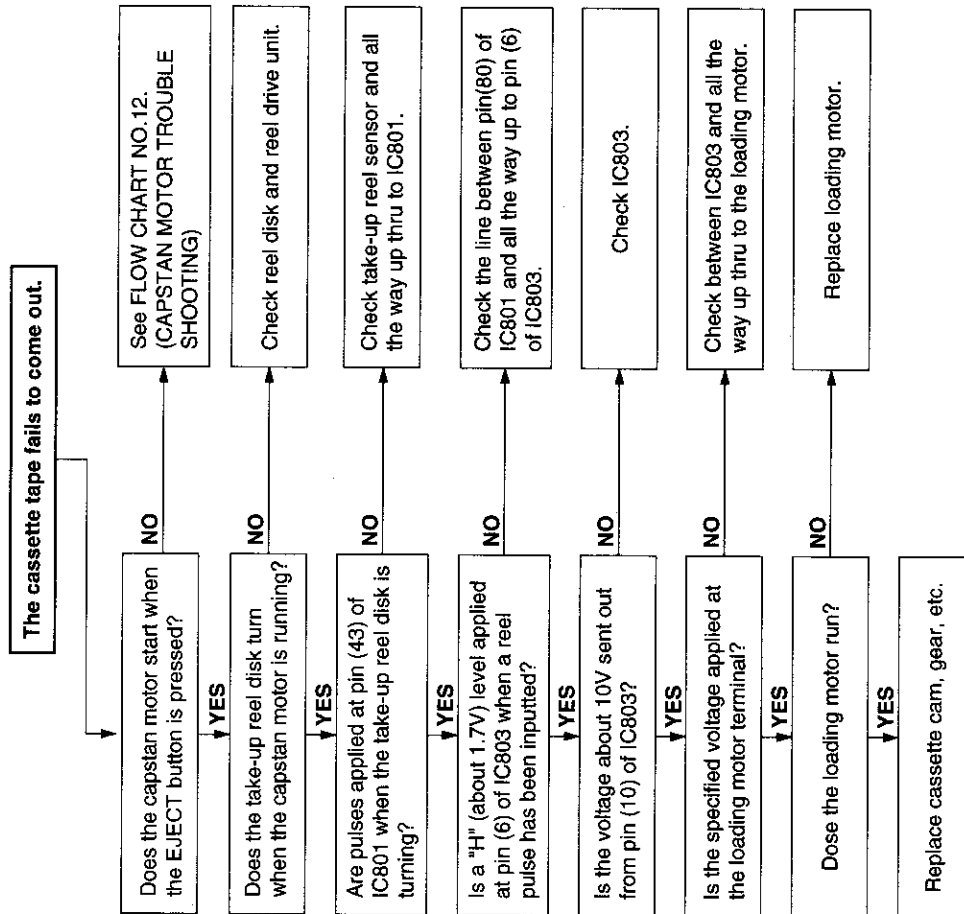
FLOW CHART NO.8 CASSETTE CONTROL TROUBLESHOOTING(1)



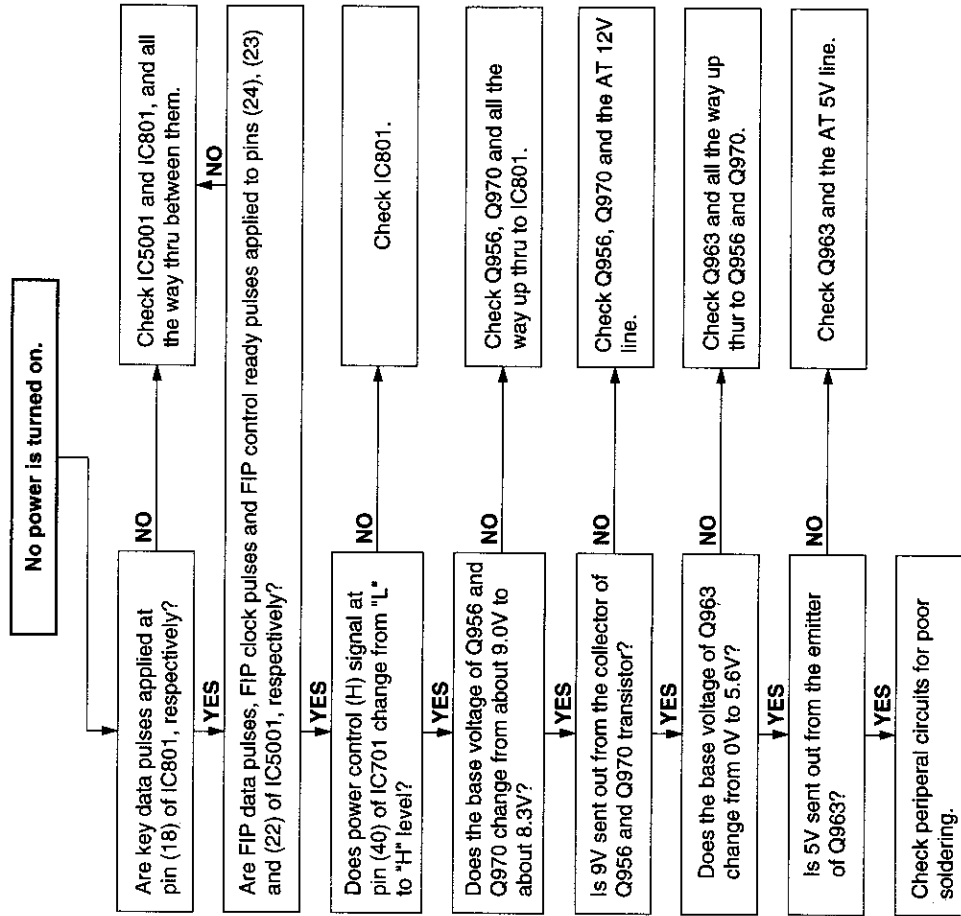
FLOW CHART NO.9 CASSETTE CONTROL TROUBLESHOOTING (2)



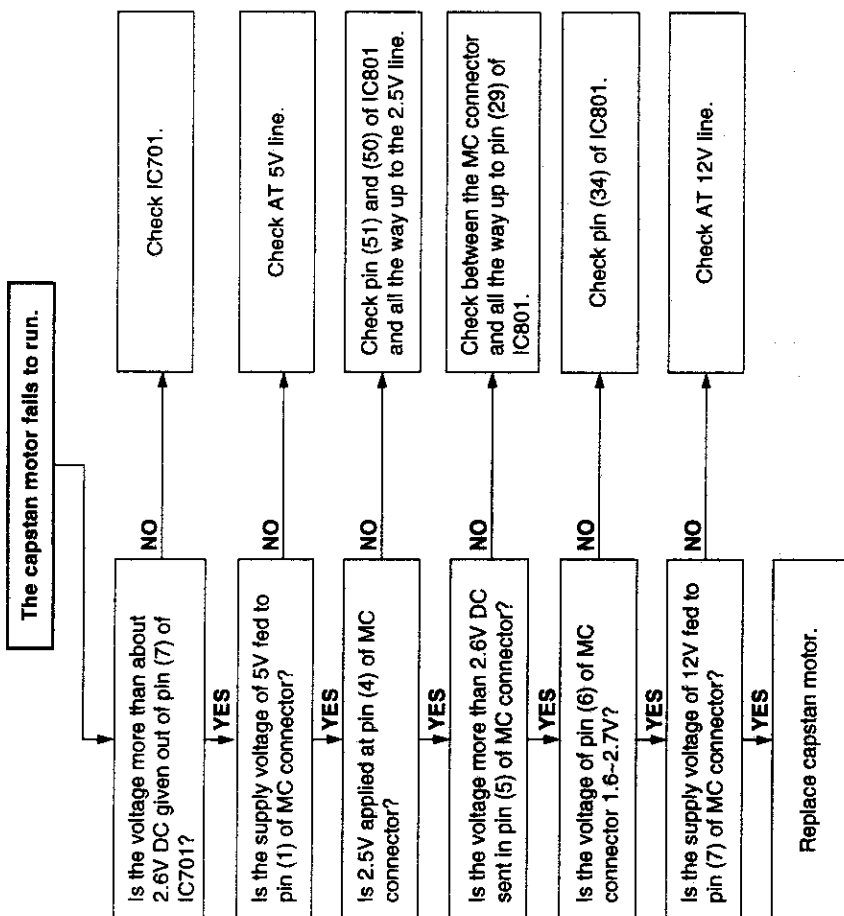
FLOW CHART NO.10 LOADING MOTOR AND EJECT TROUBLESHOOTING



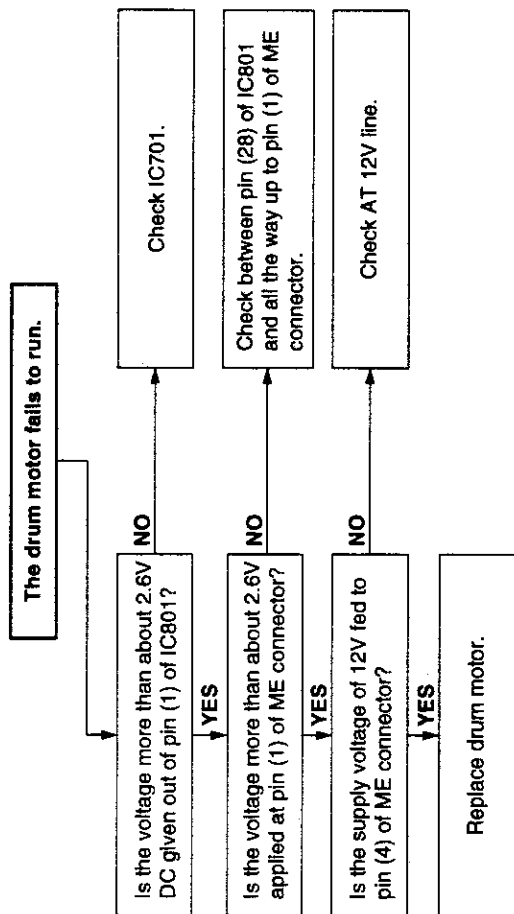
FLOW CHART NO.11 SYSTEM CONTROL TROUBLESHOOTING



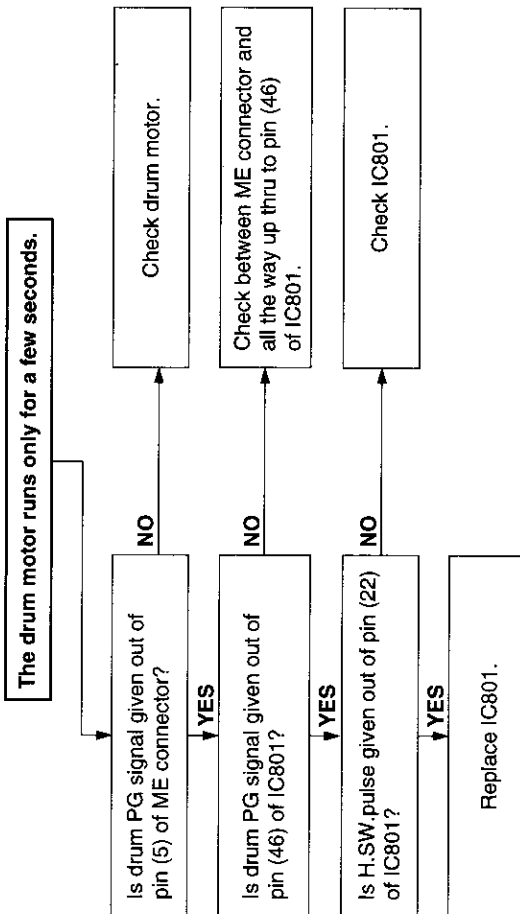
FLOW CHART NO.12 CAPSTAN MOTOR TROUBLESHOOTING



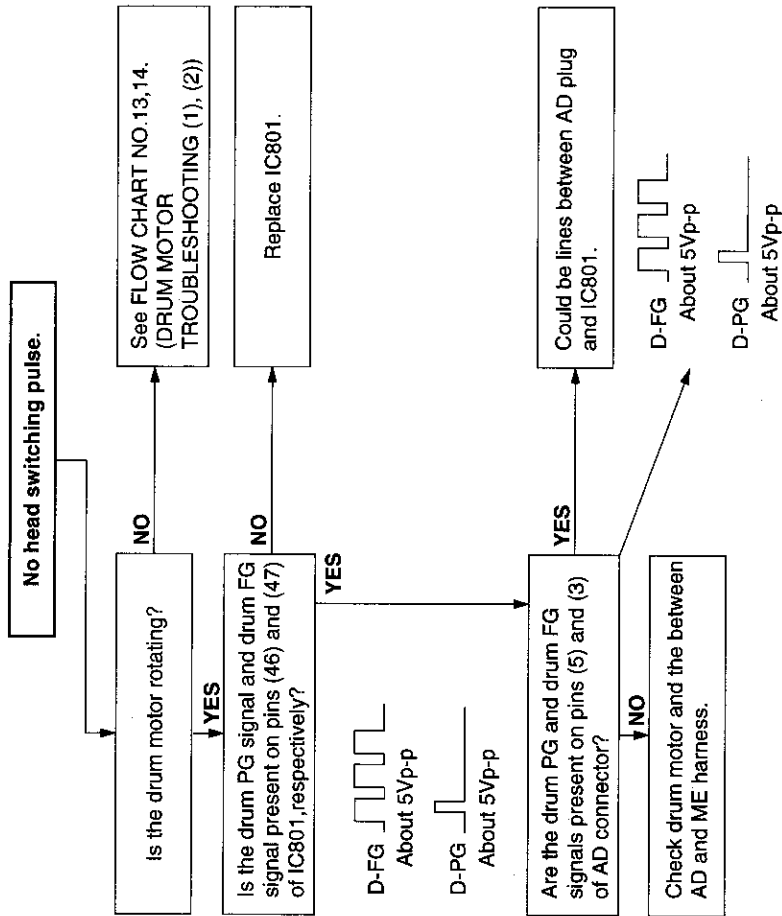
FLOW CHART NO.13 DRUM MOTOR TROUBLESHOOTING (1)



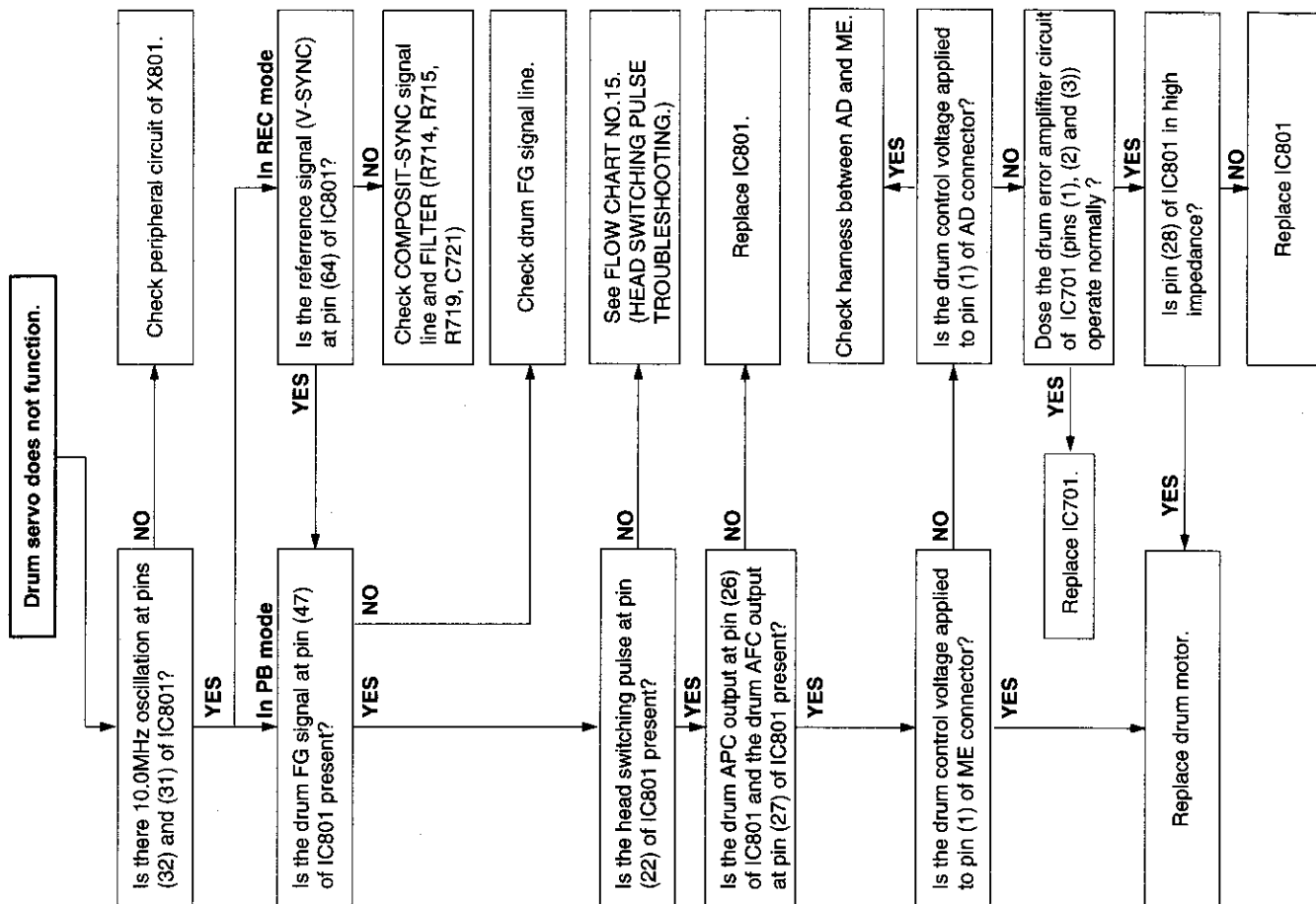
FLOW CHART NO.14 DRUM MOTOR TROUBLESHOOTING (2)



FLOW CHART NO.15 HEAD SWITCHING PULSE TROUBLESHOOTING.

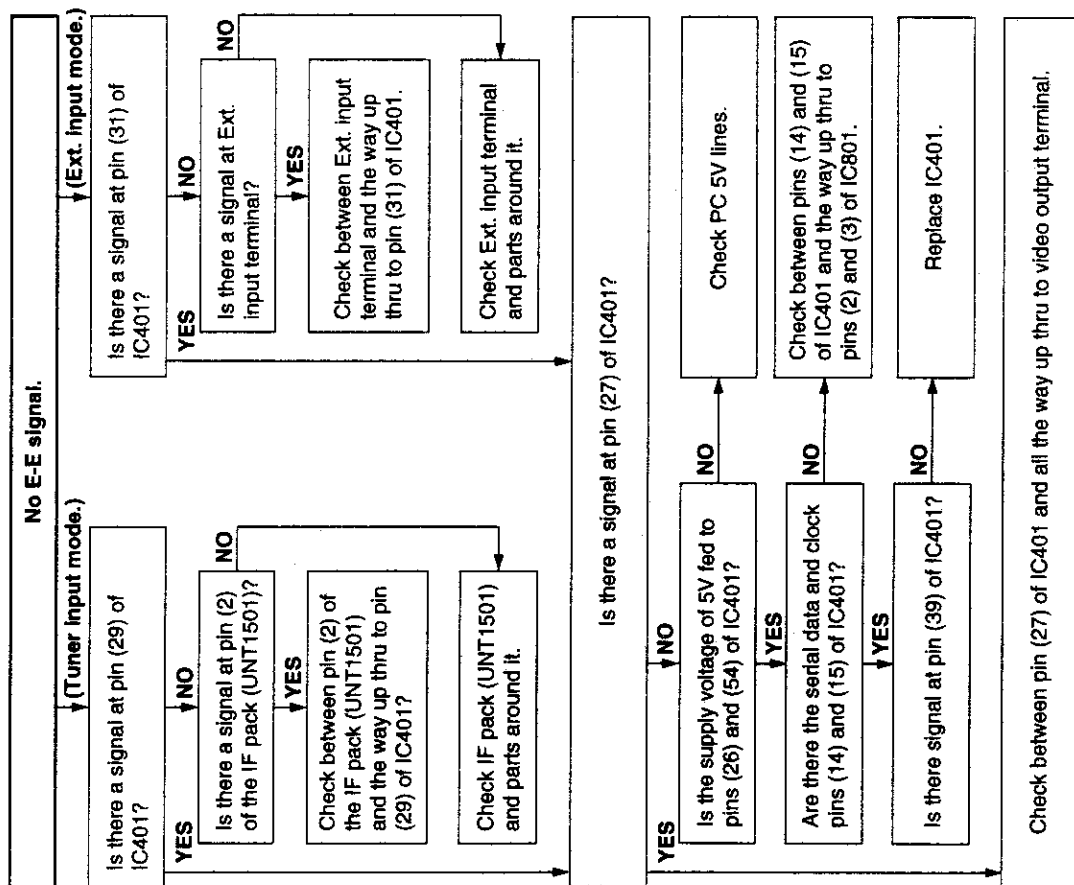


FLOW CHART NO.16 DRUM SERVO TROUBLESHOOTING

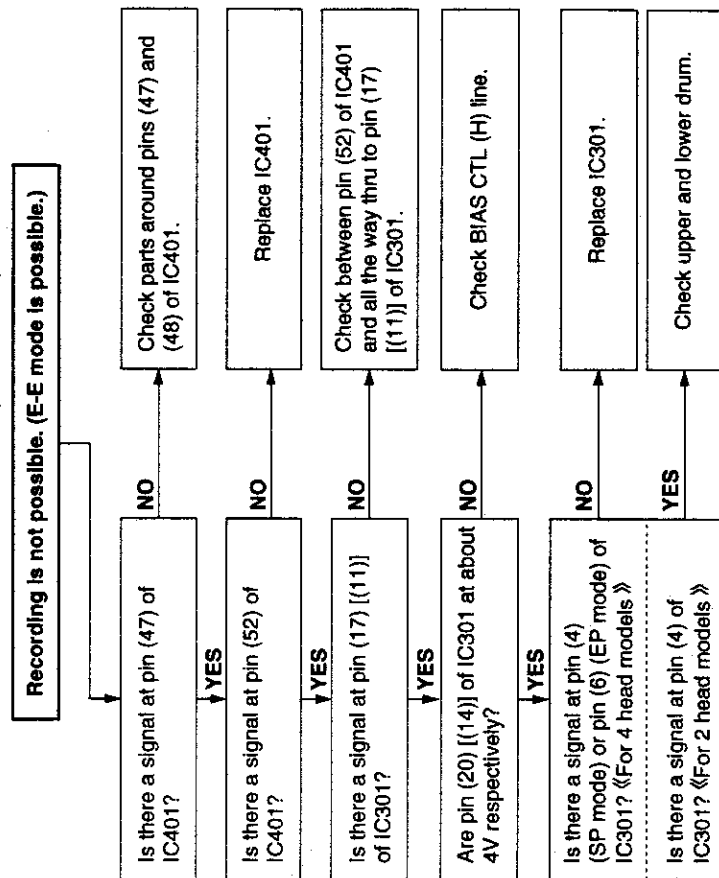




FLOW CHART NO.18 E-E MODE TROUBLESHOOTING



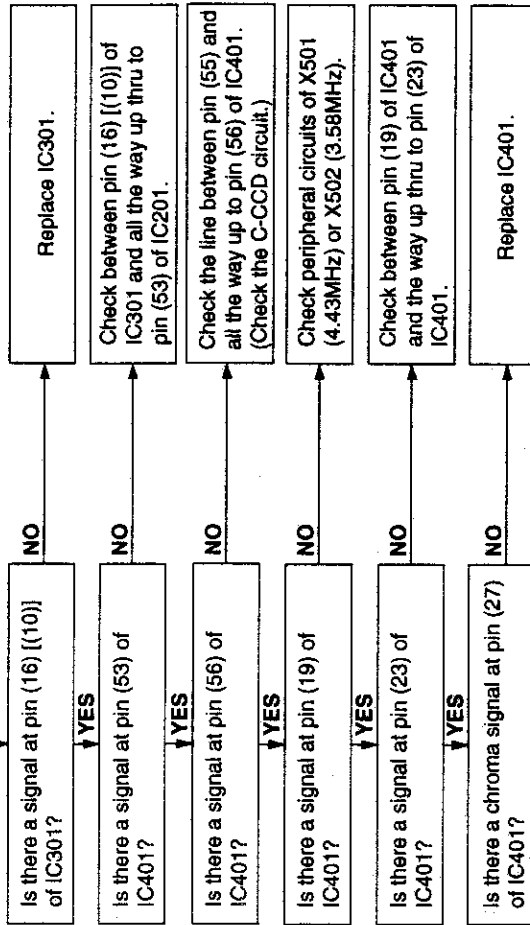
FLOW CHART NO.19 RECORDING MODE (LUMINANCE) TROUBLESHOOTING



Note: Words shown in the bracket "[]" are for the 2 head models only.

FLOW CHART NO.22 PLAYBACK MODE (CHROMA) TROUBLESHOOTING

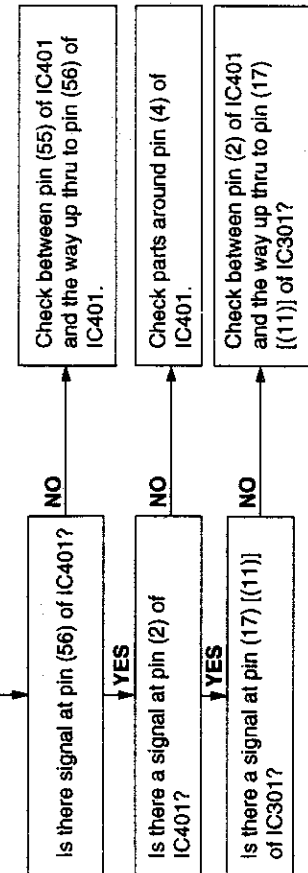
Playback is possible but without color.



Note: Words shown in the bracket "[]" are for the 2 head models only.

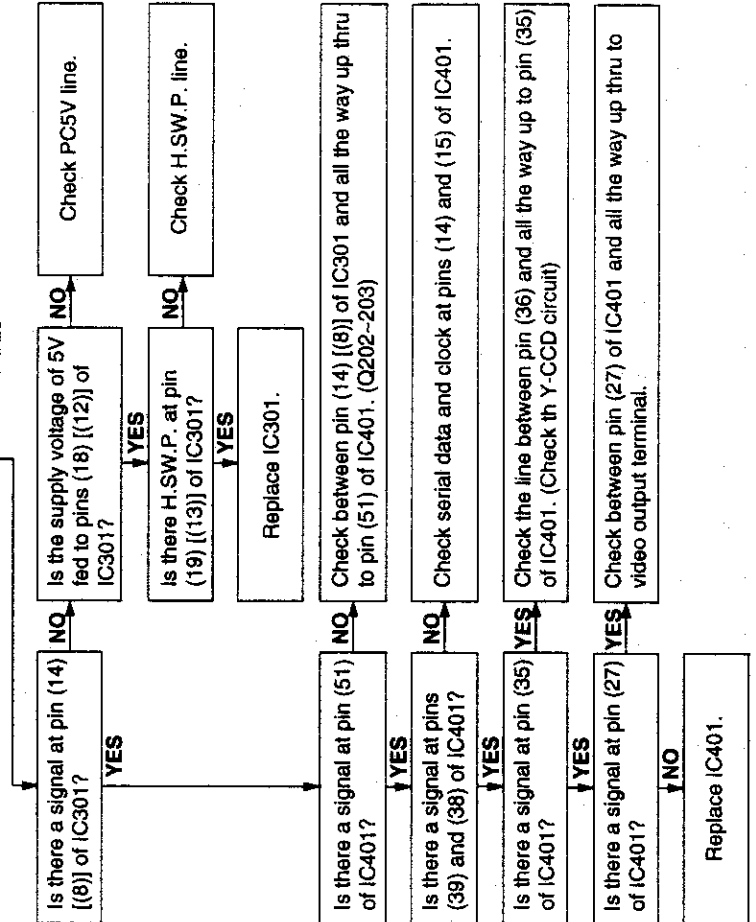
FLOW CHART NO.20 RECORDING MODE (CHROMA) TROUBLESHOOTING

Recording is possible but without color. (E-E mode is possible.)



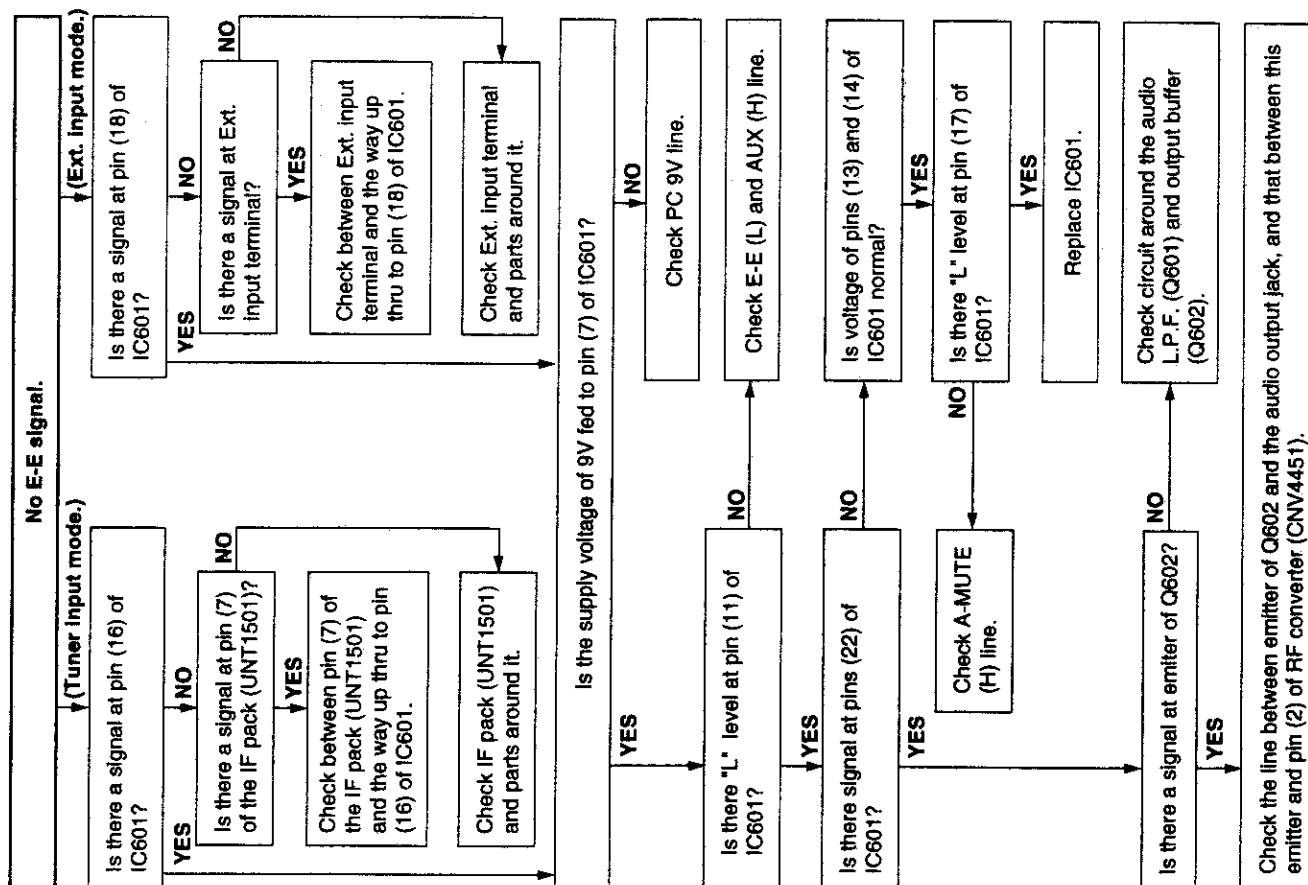
FLOW CHART NO.21 PLAYBACK MODE (LUMINANCE) TROUBLESHOOTING

Playback is not possible.

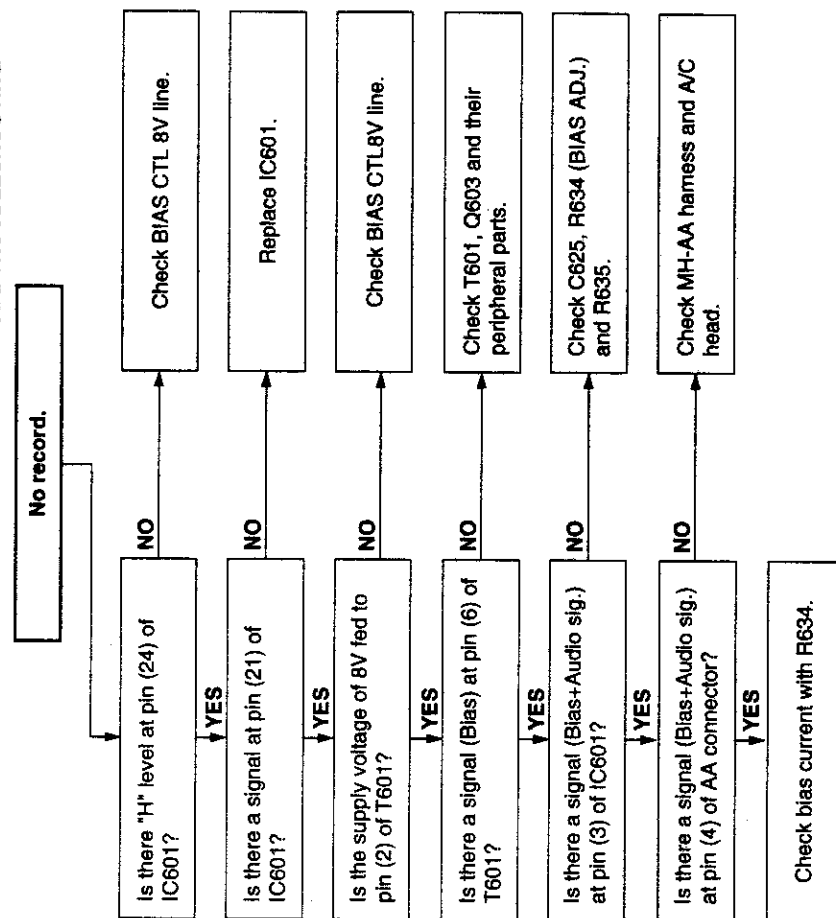


Note: Words shown in the bracket "[]" are for the 2 head models only.

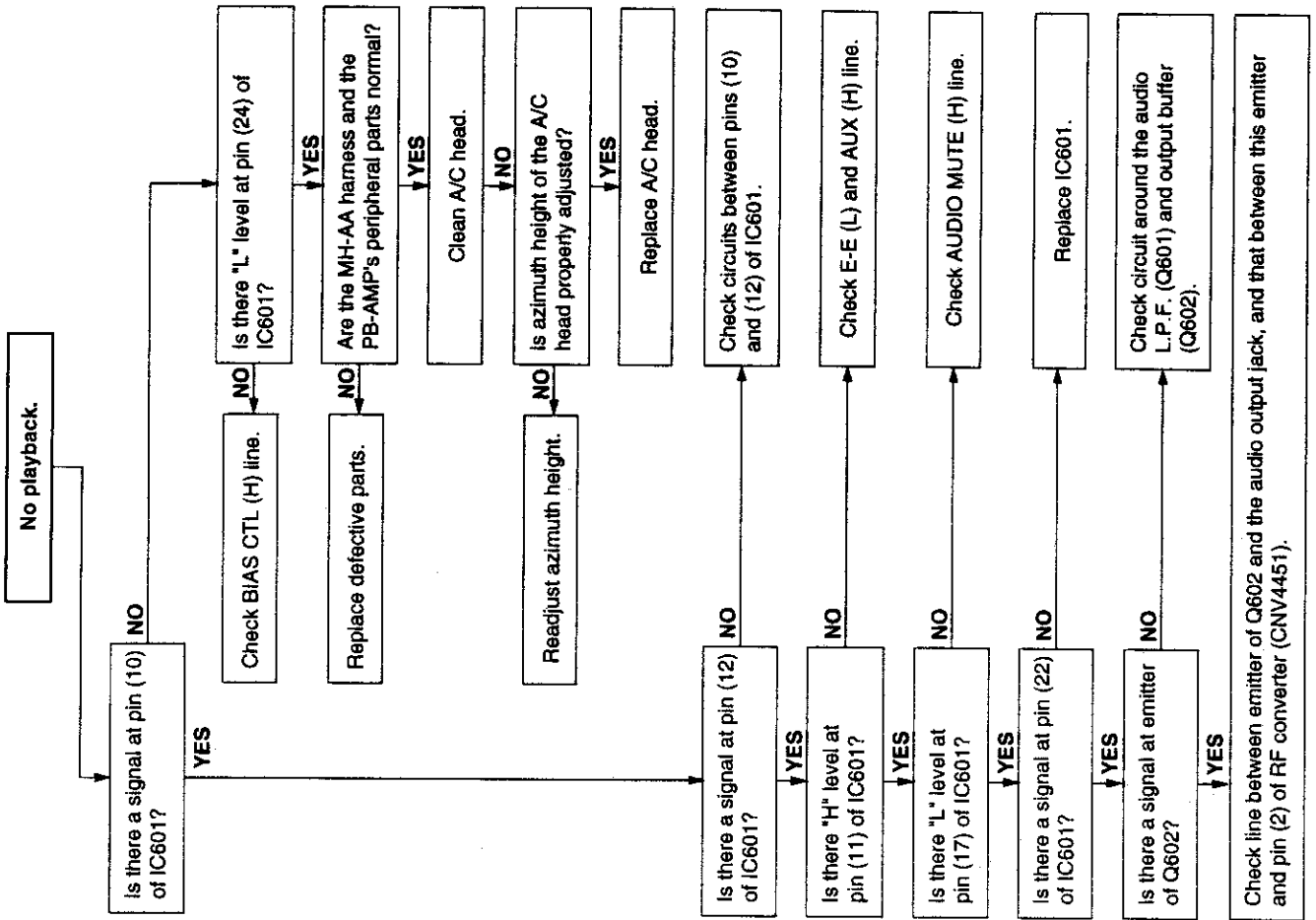
FLOW CHART NO.23 LINEAR SOUND E-E MODE TROUBLESHOOTING



FLOW CHART NO.24 LINEAR SOUND RECORDING MODE TROUBLESHOOTING



FLOW CHART NO.25 LINEAR SOUND PLAYBACK MODE TROUBLESHOOTING



REPLACEMENT OF IC804 (E²PROM)

«Servicing precautions»

When the IC804 (E²PROM) has been replaced, make the following reprogramming.

Depending on models, the IC804 (E²PROM) has been factory adjusted for it's memory function.

It's therefore necessary to reprogram the memory function for the model in question.

Note that the servo circuit requires readjustments for the slow and still modes.

Memory function reprogramming.

1. Check the power off. (power is standby mode)
2. Make for a moment short-circuit between TP5001 and TP5002, both located at the front side on the main PWB.
Be sure that all the fluorescent display tubes light up into the TEST mode.
3. Using the CHANNEL (+) and (–) buttons, select the right function numbers from among JP0-JP31, which appear in the fluorescent display tube, referring to the E²PROM map.

Press the DISPLAY button to pick up the functions (ON) and the CLEAR button to discard the functions (OFF).
DISPLAY and CLEAR buttons, are located on the remote control unit.

* When the DISPLAY button has been pressed (ON), the memory function No. starts flashing.

* When the CLEAR button has been pressed (OFF), the memory function No. lights up.

4. Make a short-circuit between TP5003 and TP5004, both located at the front side on the main PWB, and the settings will be displayed in hexadecimal notation.

Now you can see if the settings are correct.

5. Example: "ON" and "OFF" are taken as "1" and "0" respectively.

The numbers JP0 to JP31 are divided into four groups and each group's setting is displayed in hexadecimal notation.

J31	J30	J29	J28	J27	J26	J25	J24	J23	J22	J21	J20	J19	J18	J17	J16
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
↓ SPACE				↓ 0				↓ 0				↓ 0			
J15	J14	J13	J12	J11	J10	J09	J08	J07	J06	J05	J04	J03	J02	J01	J00
0	0	0	0	0	1	0	0	0	0	0	0	1	1	0	1
↓ 0				↓ 4				↓ 0				↓ D			

"000040D" appears in the fluorescent display tube.

6. Finally make for a moment short-circuit between TP5001 and TP5002, both located at the front side on the main PWB to clear the TEST mode or press the OPERATE button to turn the power on.

ROM MAP

	M201GM M20GM	M191SM M19SM	M20HM M20SM	M401SM M40SM	M211GM M21GM	M411GM M41GM	MH60GM MH60GM	MH601GM MH60GM	MH60SM MH60SM	M21HM M21SM	M41HM M41SM	MH60HM MH60HM	M211FPM M21FPM	M411FPM M41FPM	M201FPM M20FPM	M400BM M400BM	M210BM M210BM	M410BM M410BM	MH60FPM MH60FPM	
JP31 —	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
30 —	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
29 —	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
28 —	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
27 NTSC PB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
26 VIDEO INSTANT WIPER REPLAY	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	
25 HEAD 1	0	0	0	1	0	1	1	1	1	0	1	1	0	1	0	1	0	1	1	
24 HEAD 0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	
23 Hi-Fi	0	0	0	0	0	0	1	1	1	0	0	1	0	0	0	0	0	0	1	
22 AUTO CLOCK	0	0	0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	1	
AUTO SORTING																				
21 DECODER	1	1	0	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	
20 SHUTTLE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
19 NICAM 1	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	
18 NICAM 0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	
17 G-CODE 1	0	0	0	0	1	1	1	1	1	0	0	0	1	1	0	0	1	1	1	
16 G-CODE 0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	
15 OEM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
14 LP	0	0	1	1	0	1	1	1	1	1	1	1	0	1	0	1	0	1	1	
13 F-AV	0	0	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	1	
12 2 SCART	0	0	0	0	0	0	1	1	1	0	0	1	1	1	1	0	0	0	1	
11 CATV/PIF	1	1	0	1	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1	
10 TUNER 2	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	1	
9 TUNER 1	0	0	1	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	
8 TUNER 0	0	0	1	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	1	
7 SYSTEM 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6 SYSTEM 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5 VCR 1	0	0	1	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	
4 VCR 0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	1	
3 PDC	1	0	0	0	1	1	1	1	1	0	0	1	0	0	0	0	0	0	0	
2 VPS	1	0	0	0	1	1	1	1	1	0	0	1	0	0	0	0	0	0	0	
1 COLOR 1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	1	
0 COLOR 0	1	1	0	1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	0	
DISPLAY	030080D	0300801	1104320	2304801	472080D	672480D	6F2780D	6F2580D	6FE780D	5514320	6514320	6F9732C	4721D12	6725D12	4301D12	0300801	2304801	4320801	6324801	5FE7D12

(Note: "1" : flashing "0" : lights up)

MEMO

Lined area for writing the memo.

The diagram is a comprehensive schematic of a VCR control system, organized into 12 vertical sections. It details the internal electronic and mechanical components of a VCR.

Section 1: Input and Initial Processing
 - Includes the CTL HEAD input and CTL HEAD output.
 - Features a CTL AMP IN, CTL AMP, and CTL AMP OUT.
 - Shows a CTL HEAD output and CTL HEAD input.

Section 2: Control and Timing
 - Includes a CTL AMP IN, CTL AMP, and CTL AMP OUT.
 - Shows a CTL HEAD output and CTL HEAD input.

Section 3: Video Processing
 - Includes a CTL AMP IN, CTL AMP, and CTL AMP OUT.
 - Shows a CTL HEAD output and CTL HEAD input.

Section 4: Audio Processing
 - Includes a CTL AMP IN, CTL AMP, and CTL AMP OUT.
 - Shows a CTL HEAD output and CTL HEAD input.

Section 5: Motor Control
 - Includes a CTL AMP IN, CTL AMP, and CTL AMP OUT.
 - Shows a CTL HEAD output and CTL HEAD input.

Section 6: Servo and Timing
 - Includes a CTL AMP IN, CTL AMP, and CTL AMP OUT.
 - Shows a CTL HEAD output and CTL HEAD input.

Section 7: Drum Motor Unit
 - Includes a CTL AMP IN, CTL AMP, and CTL AMP OUT.
 - Shows a CTL HEAD output and CTL HEAD input.

Section 8: Loading Motor Unit
 - Includes a CTL AMP IN, CTL AMP, and CTL AMP OUT.
 - Shows a CTL HEAD output and CTL HEAD input.

Section 9: Sensor and Control
 - Includes a CTL AMP IN, CTL AMP, and CTL AMP OUT.
 - Shows a CTL HEAD output and CTL HEAD input.

Section 10: Power and Reset
 - Includes a CTL AMP IN, CTL AMP, and CTL AMP OUT.
 - Shows a CTL HEAD output and CTL HEAD input.

Section 11: Infrared Receiver
 - Includes a CTL AMP IN, CTL AMP, and CTL AMP OUT.
 - Shows a CTL HEAD output and CTL HEAD input.

Section 12: Final Output and Control
 - Includes a CTL AMP IN, CTL AMP, and CTL AMP OUT.
 - Shows a CTL HEAD output and CTL HEAD input.

The diagram is a complex representation of the electronic and mechanical systems of a VCR. It includes a list of components on the left and a list of connections on the right. The diagram is a complex representation of the electronic and mechanical systems of a VCR.

SIGNAL FLOW BLOCK DIAGRAM

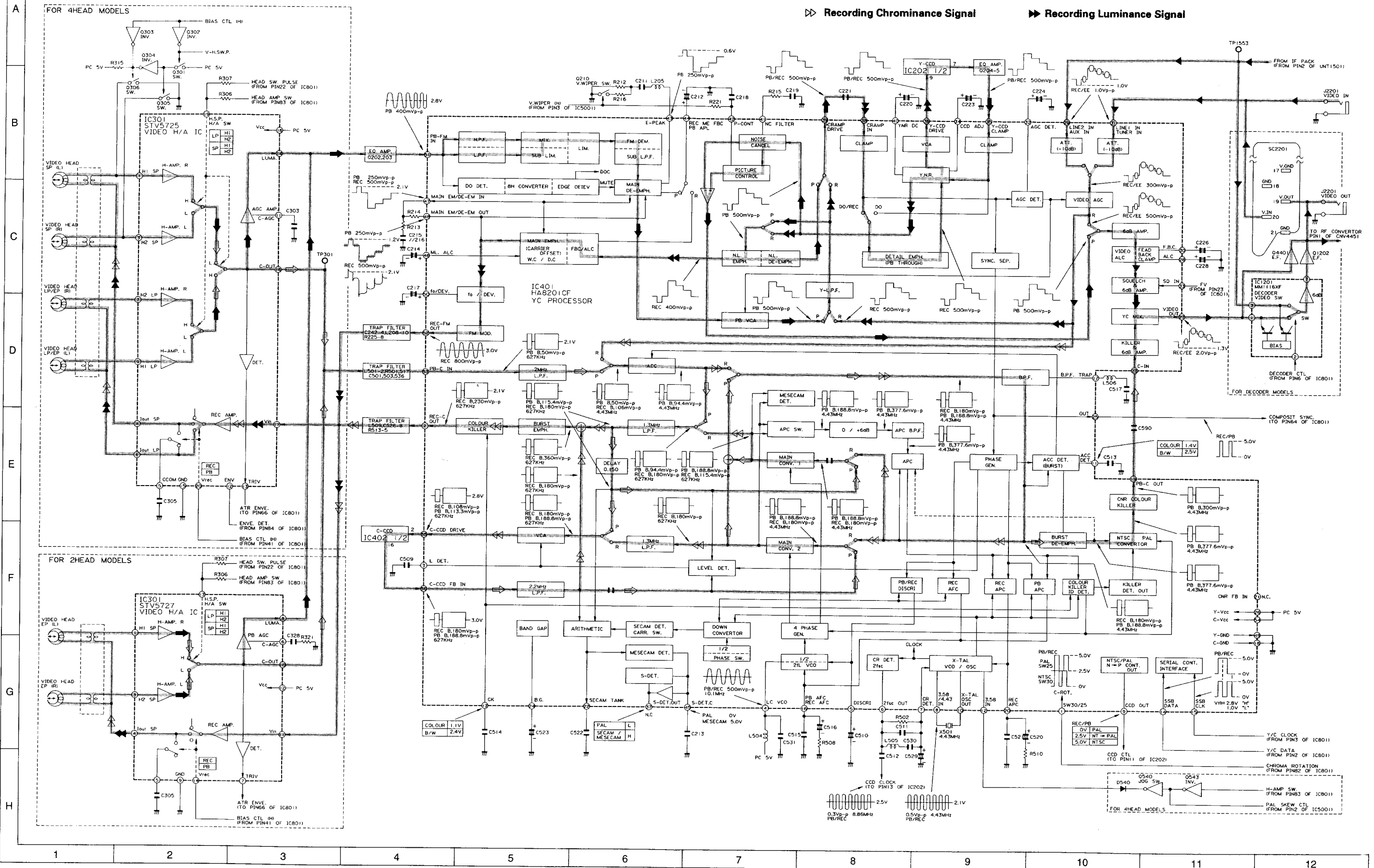
⇒ Playback Chrominance Signal

⇒ Playback Luminance Signal

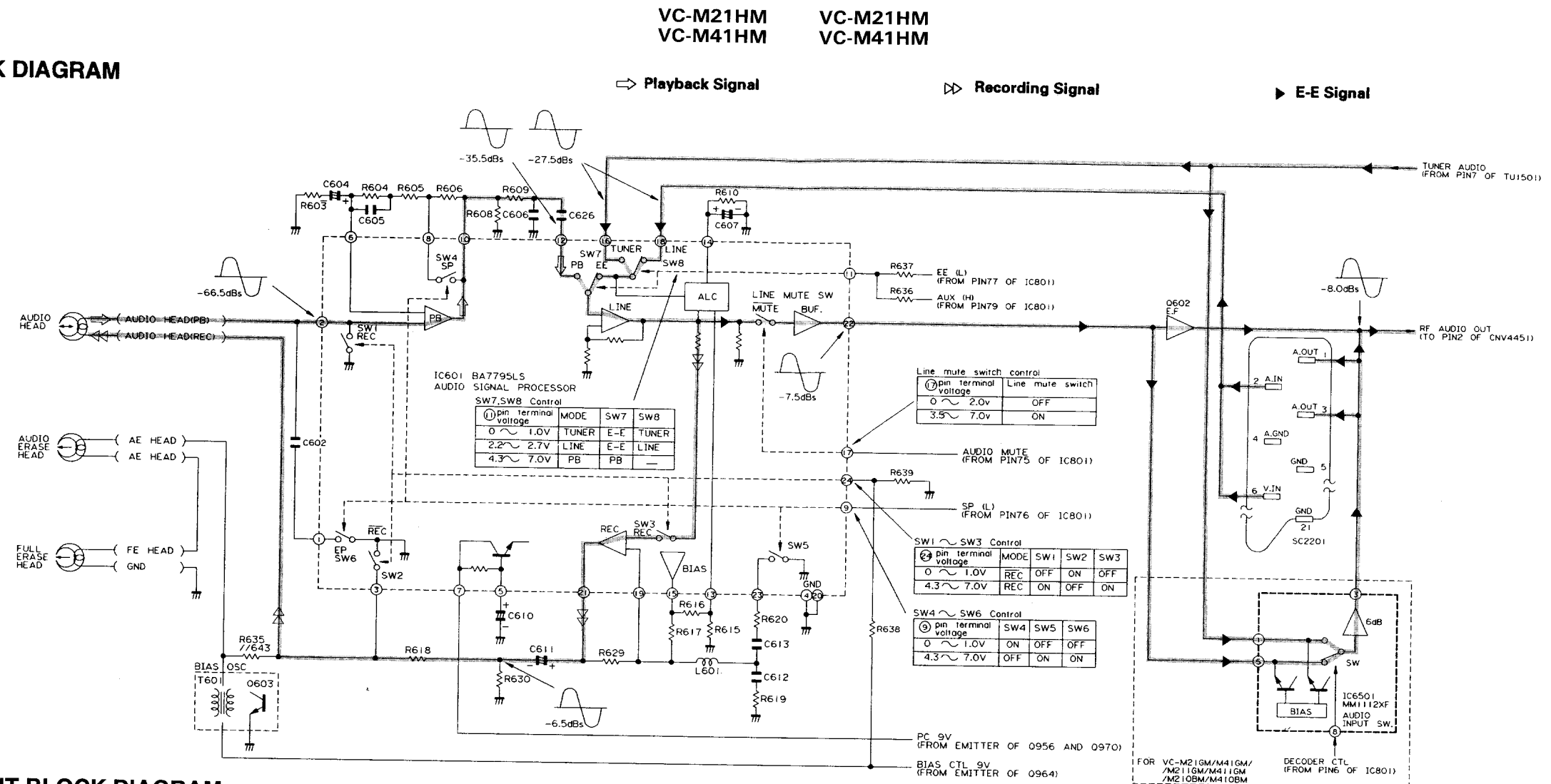
⇒ E-E Signal

⇒ Recording Chrominance Signal

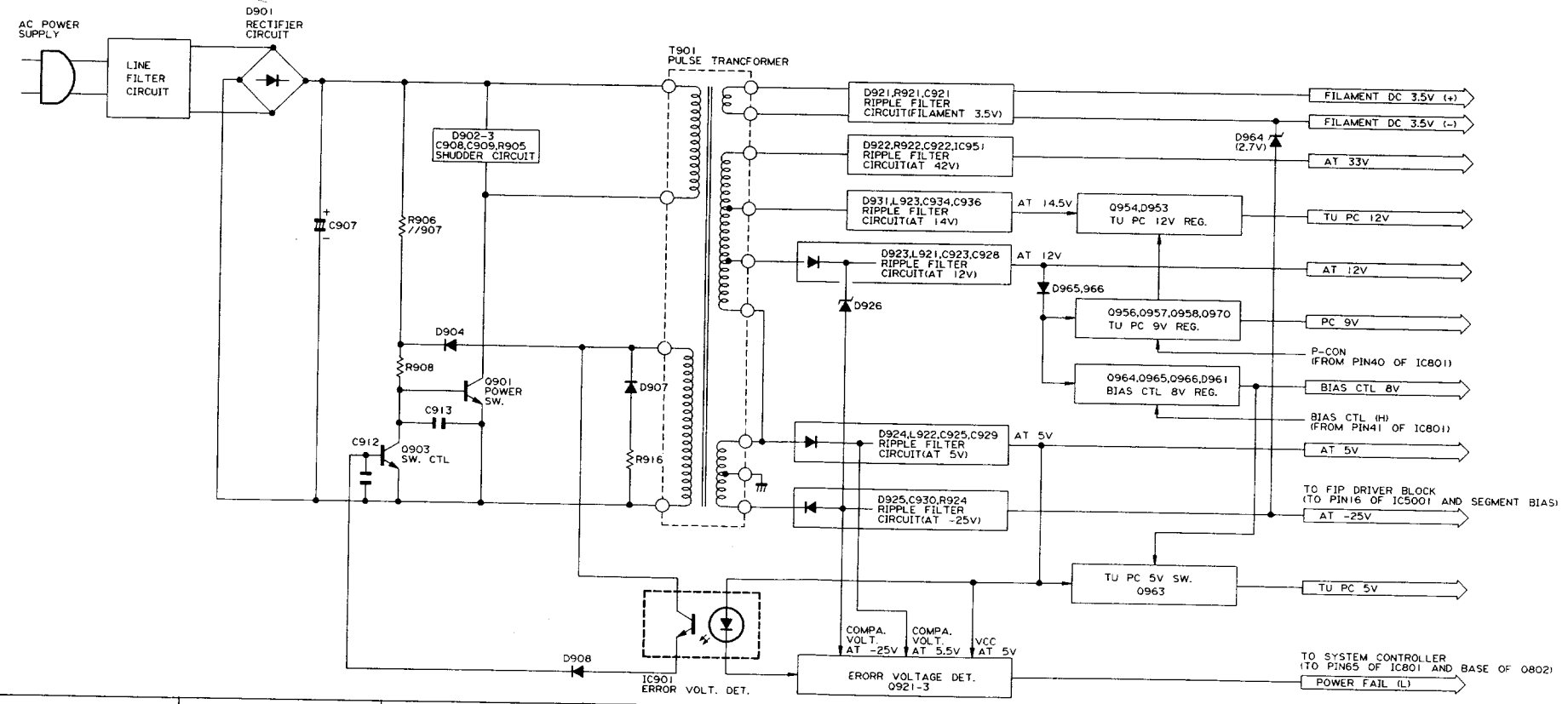
⇒ Recording Luminance Signal



AUDIO BLOCK DIAGRAM



POWER CIRCUIT BLOCK DIAGRAM



MEMO

SCHEMATIC DIAGRAM

IMPORTANT SAFETY NOTICE:
BE SURE TO USE GENUINE PARTS FOR SECURING THE SAFETY AND RELIABILITY OF THE SET.
PARTS MARKED WITH * Δ * AND PARTS SHADED (IN BLACK) ARE ESPECIALLY IMPORTANT FOR MAINTAINING THE SAFETY AND PROTECTING ABILITY OF THE SET.
BE SURE TO REPLACE THEM WITH PARTS OF SPECIFIED PART NUMBER.

SAFETY NOTES:
1. DISCONNECT THE AC PLUG FROM THE AC OUTLET BEFORE REPLACING PARTS.
2. SEMICONDUCTOR HEAT SINKS SHOULD BE REGARDED AS POTENTIAL SHOCK HAZARDS WHEN THE CHASSIS IS OPERATING.

NOTES:
1. The unit of resistance "ohm" is omitted ($k=1000$ ohm, $M=1$ Meg ohm).
2. All resistors are 1/8 watt, unless otherwise noted.
3. The unit of capacitance "F" is omitted ($\mu=\mu F$, $p=\mu\mu F$).
4. The values in parentheses are the ones in the PB mode; the values without parentheses are the ones in the REC mode.

VOLTAGE MEASUREMENT CONDITIONS:
1. DC voltages are measured between points indicated and chassis ground by VTVM, with AC230V~240V/50Hz supplied to unit and all controls are set to normal viewing picture unless otherwise noted.
2. Voltages are measured with 10000 μV B & W or colour noted.

WAVEFORM MEASUREMENT CONDITIONS:
10000 μV 87.5 percent modulated colour bar signal is fed into tuner.

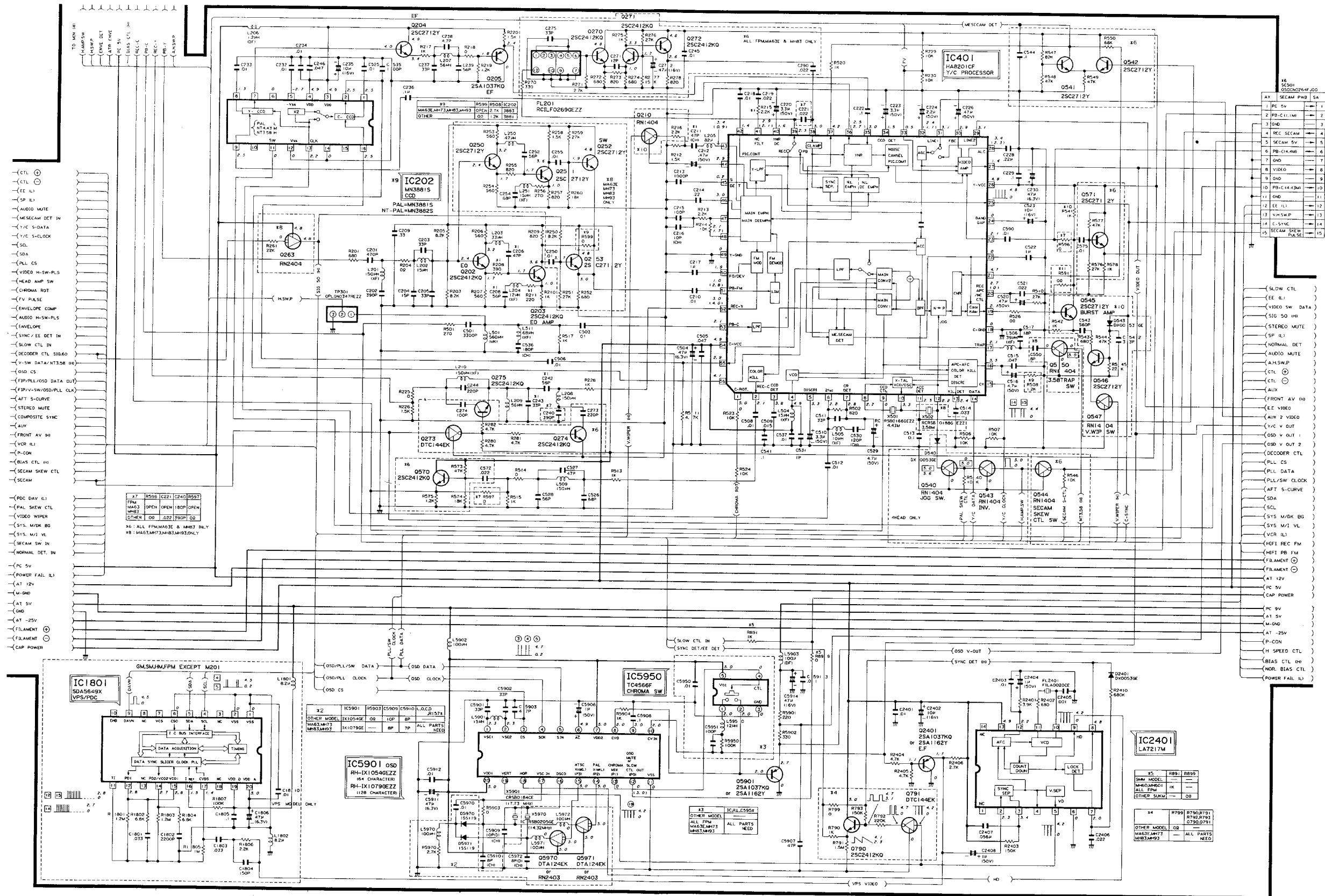
CAUTION:
This circuit diagram is original one. Therefore there may be a slight difference from yours.

VC-M21HM	VC-M21HM
VC-M41HM	VC-M41HM



VC-M21HM	VC-M21HM
VC-M41HM	VC-M41HM

#1	C208	R208	C242	R211	C243	C206	C211	R215
2ND	82P	470	82P	220	56P	47P	39P	3.9K
4ND	68P	390	56P	150	47P	56P	39P	3.9K
2ND (LP)	56P	470	56P	220	47P	56P	47P	2.2K
SEC AM								

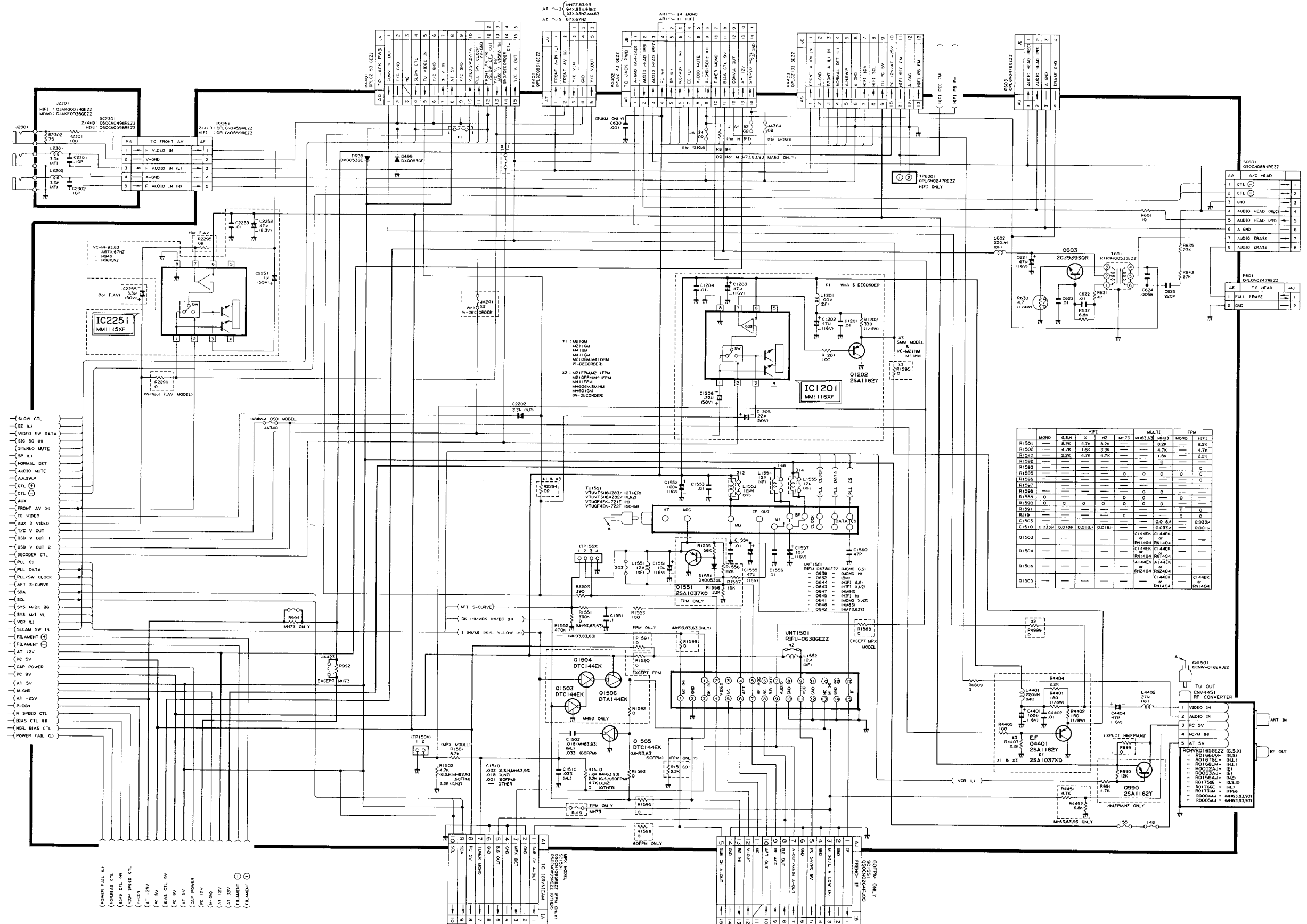


PB Parentheses ()
REC Without Parentheses

MAIN (3) CIRCUIT

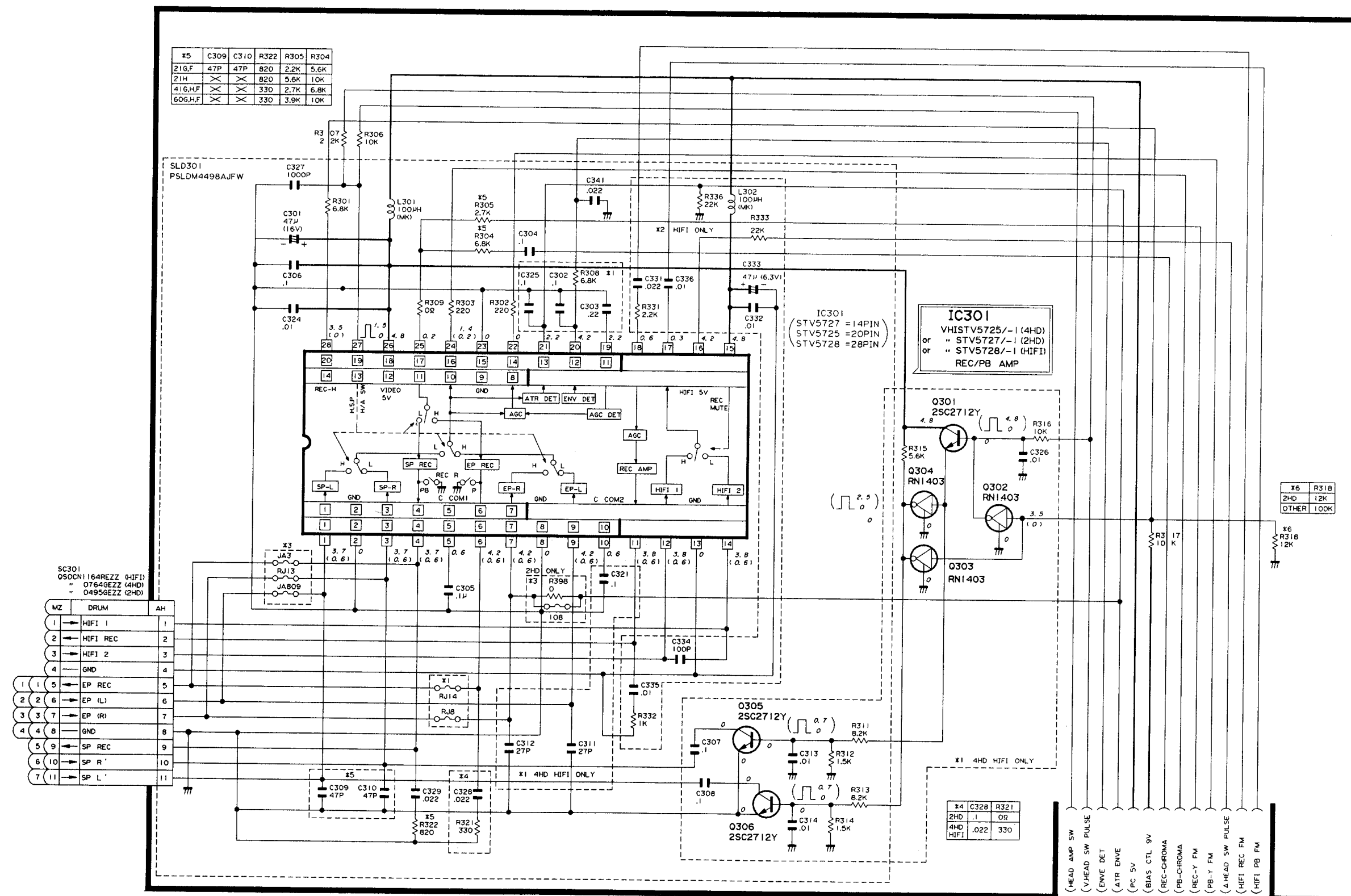
VC-M21HM
VC-M41HM

VC-M21HM
VC-M41HM

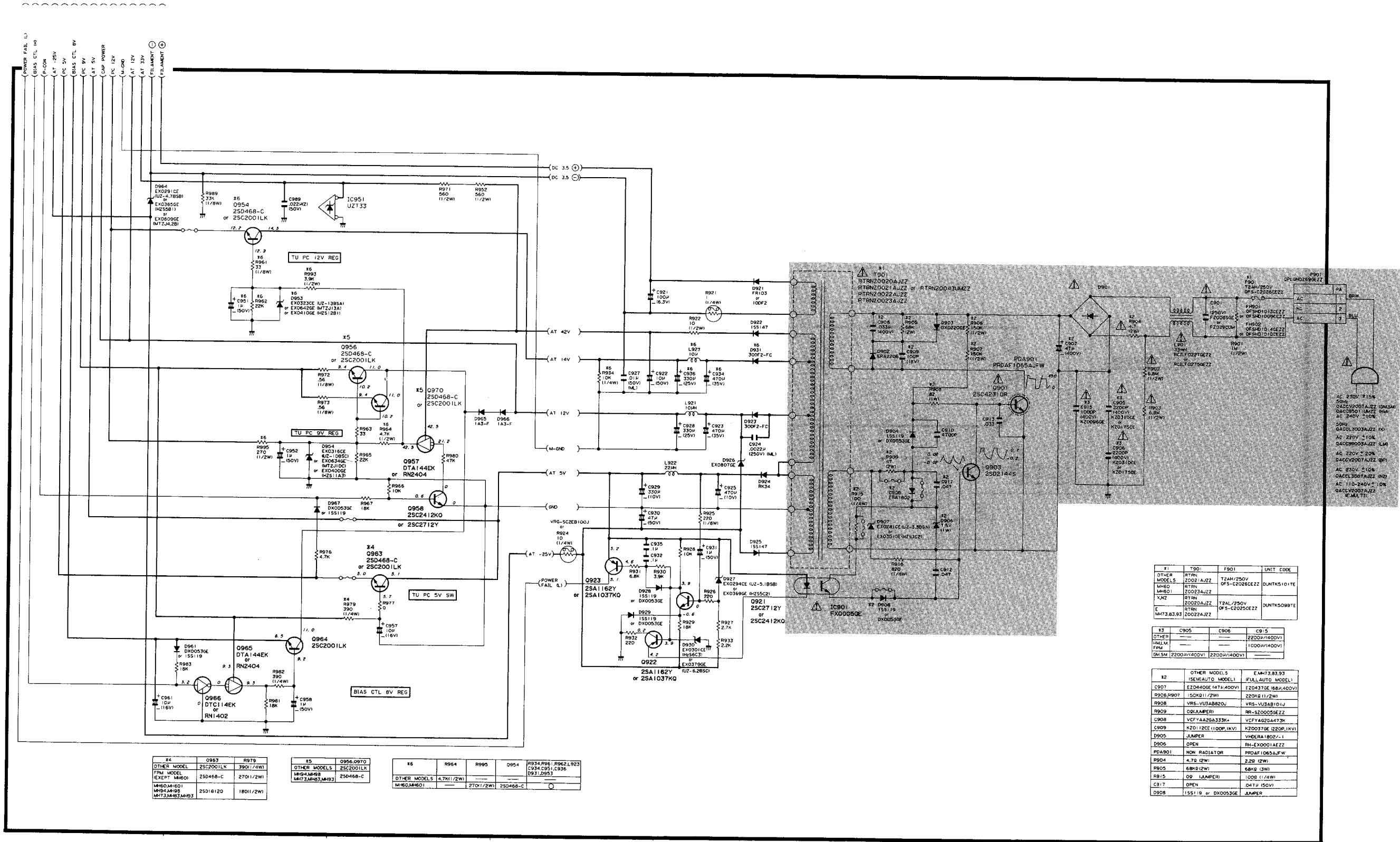


* VOLTAGE MEASUREMENT MODE
PB Parentheses ()
REC Without Parentheses

MAIN (4) CIRCUIT



MAIN (5) CIRCUIT



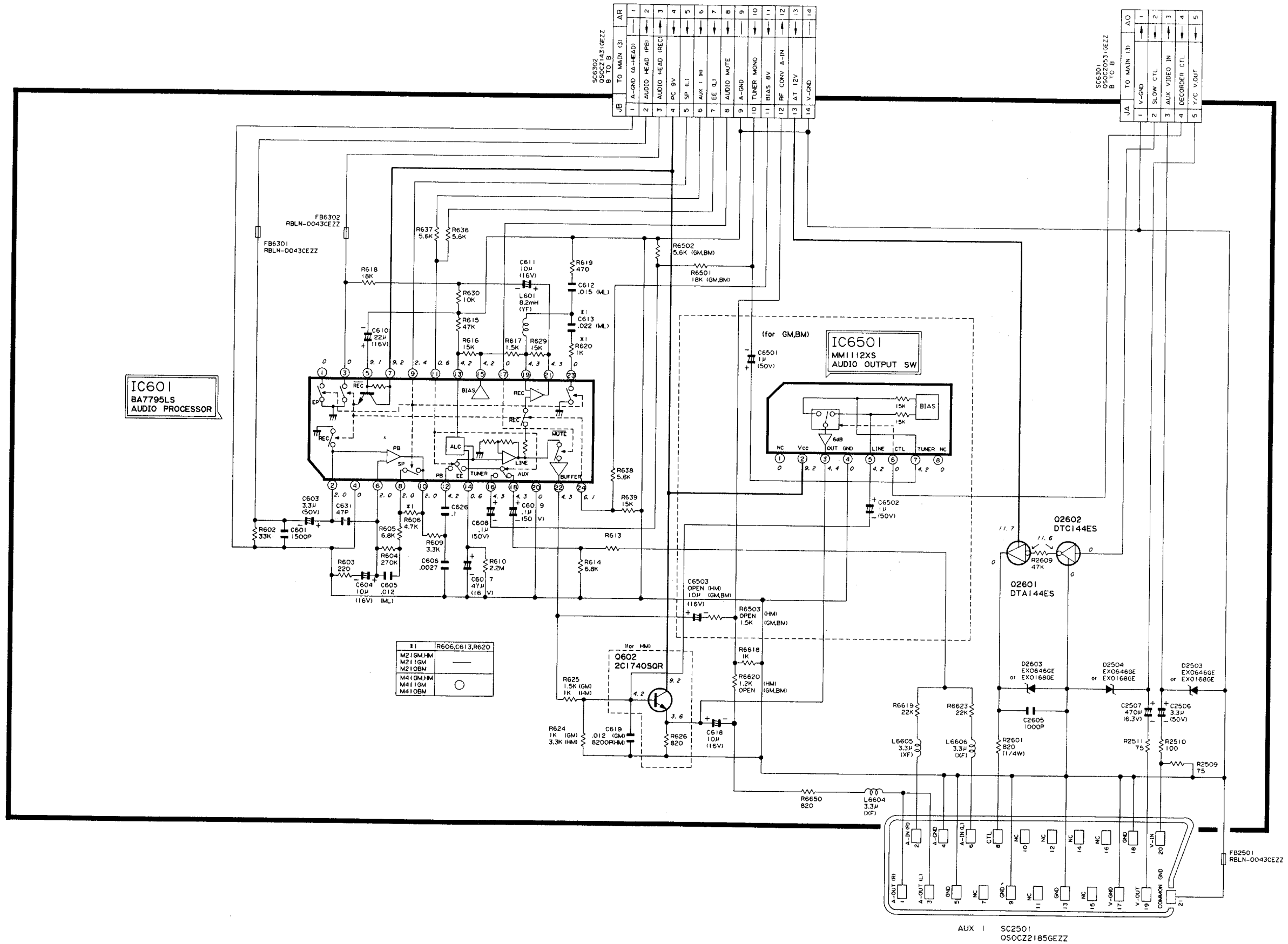
#1	T901	F901	UNIT CODE
OTHER	RTN	T2AH/250V	DUNT5101TE
MODEL5	2002AJZZ	0F5-C2026CEZZ	
MHEO	RTN	2002AJZZ	
MH501	RTN	2002AJZZ	
XJ02	RTN	2002AJZZ	
L	RTN	0F5-C2025CEZZ	DUNT509BTE
MH73.83.93	2002AJZZ		

#3	C905	C906	C915
OTHER	---	---	2200K/400V1
HALM	---	---	1000K/400V1
FM	---	---	---
DA/SM	2200K/400V1	2200K/400V1	---

#2	OTHER MODEL5	FM/73.83.93
C807	25D468-C	25C2001LK
R906/R907	150K/1/2W1	220K/1/2W1
R908	VRS-VUAB820V	VRS-VUAB810V
R909	08JAMPER1	RR-S20005SEZZ
C908	VCF*AA20A33K+	VCF*AA20A473K
C909	K2D112C(100P.1KV)	K200370E(220P.1KV)
D905	JAMPER	VHDERA1802/-1
D906	OPEN	RR-EX0001AEZZ
PD901	NON RADIATOR	PRDAF1065AFW
D904	4.75(2W)	2.25(2W)
D905	48K/0.2W	68K/0.2W
R915	08 JAMPER	100K(1/4W)
C917	OPEN	047J(50V)
D908	155119 or DX00530E	JAMPER

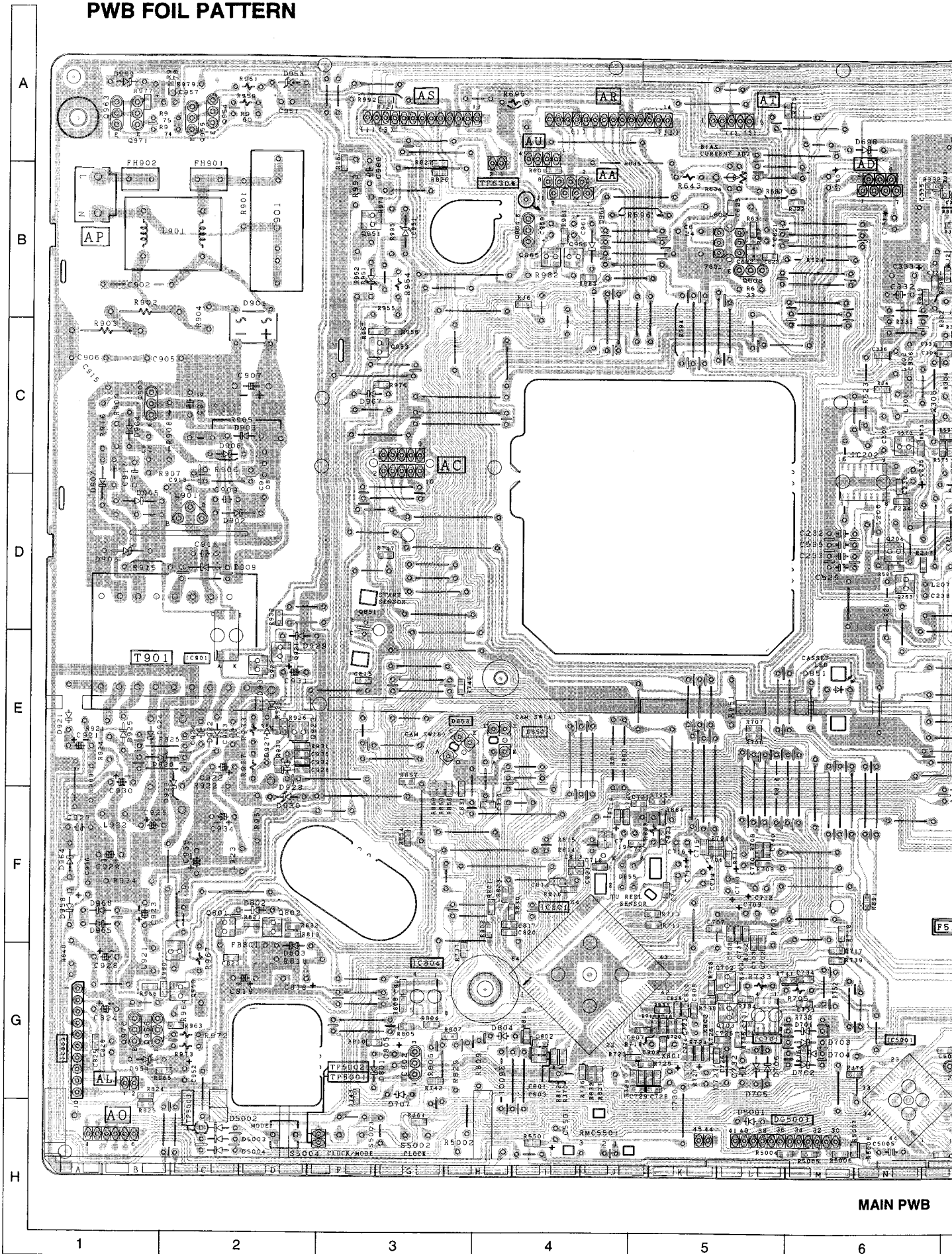
* VOLTAGE MEASUREMENT MODE
PB Parentheses ()
REC Without Parentheses

TERMINAL CIRCUIT

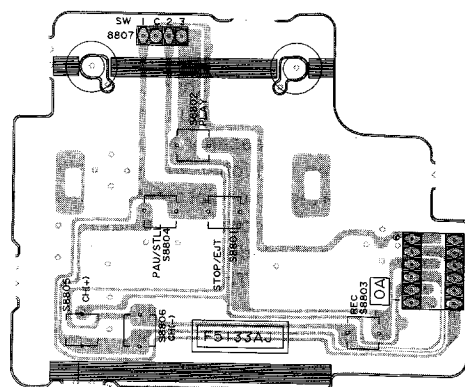
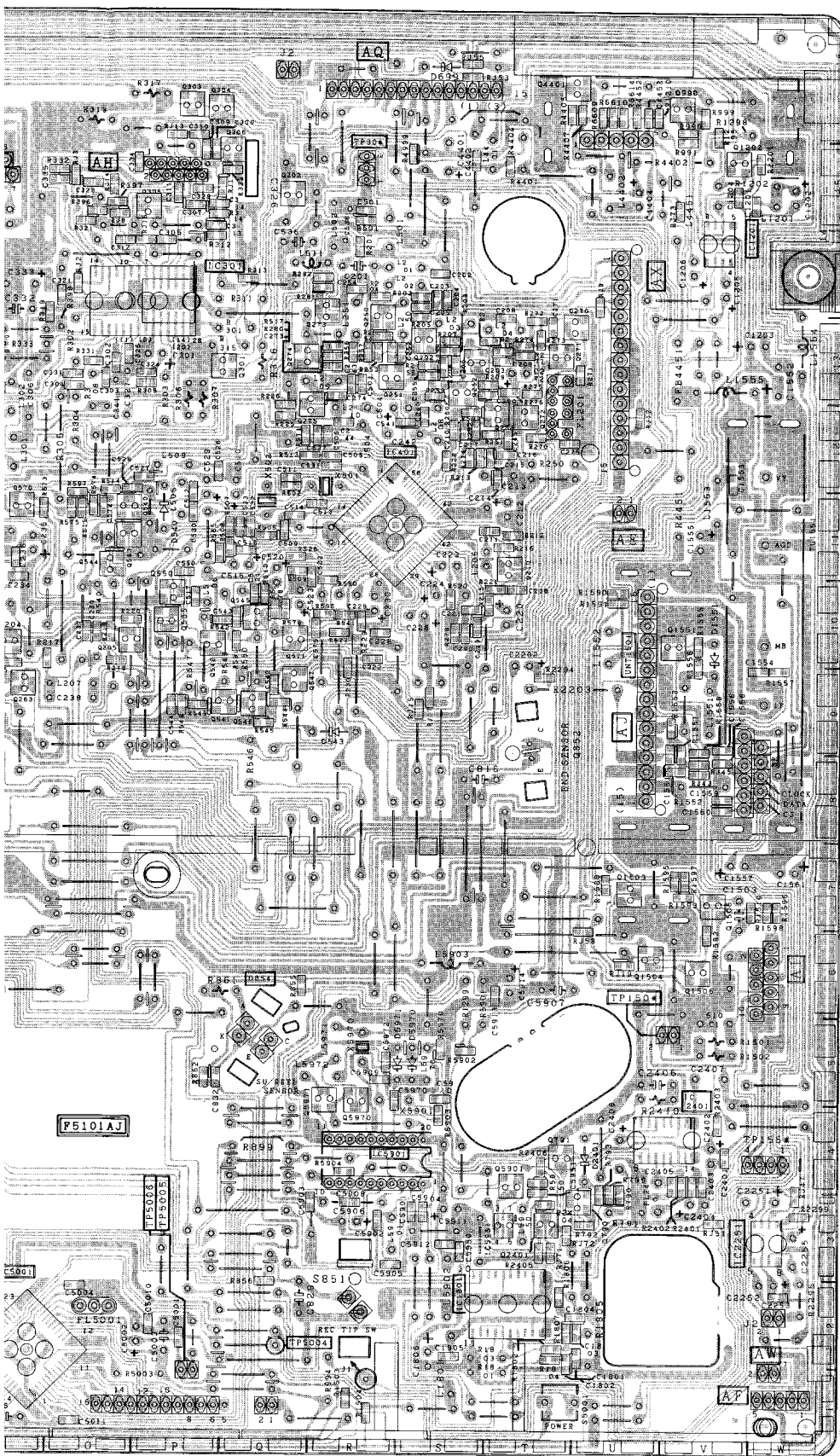


*** VOLTAGE MEASUREMENT MODE**
 Parentheses ()
 .EC Without Parentheses

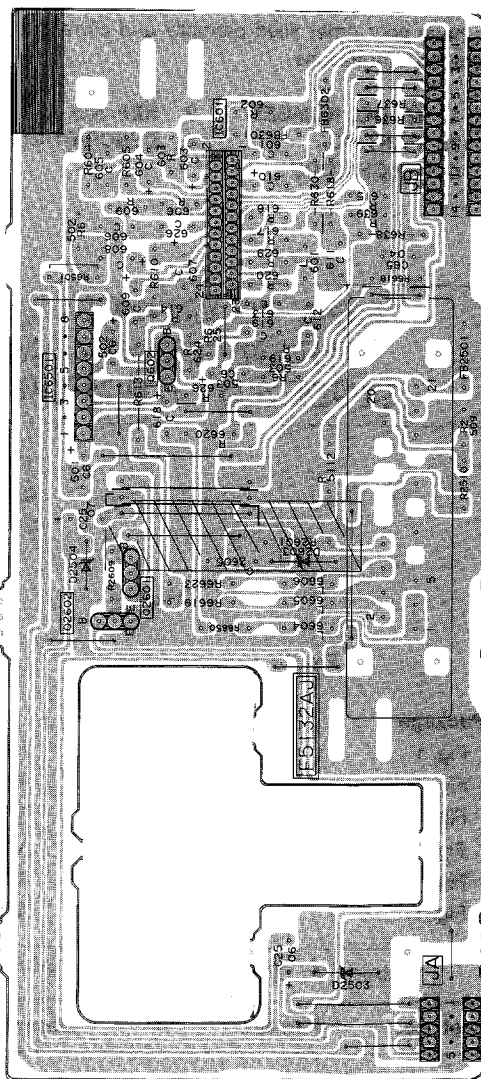
PWB FOIL PATTERN



MAIN PWB



OPERATION PWB




Terminal PWB

I PWB

	7	8	9	10	11	12
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10. REPLACEMENT PARTS LIST

PARTS REPLACEMENT

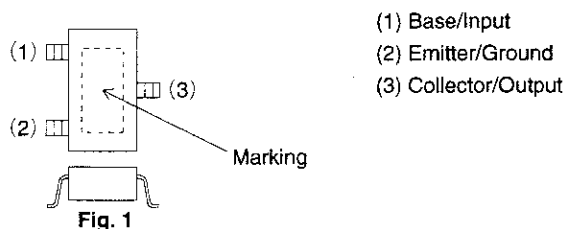
Many electrical and mechanical parts in video cassette recorder have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this manual; electrical components having such features are identified by  and shaded areas in the Replacement Parts Lists and Schematic Diagrams. The use of a substitute replacement part which does not have the same safety characteristics as the factory recommended replacement parts shown in this service manual may create shock, fire or other hazards.

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

- | | |
|-----------------|----------------|
| 1. MODEL NUMBER | 2. REF. NO. |
| 3. PART NO. | 4. DESCRIPTION |
| 5. PRICE CODE | |

HOW TO IDENTIFY CHIP TRANSISTORS AND DIODES BY ITS MARKING



Package	Marking	Parts No.
Fig. 1	25	VSDTC124EK / -1
Fig. 1	24	VSDTC114EK / -1
Fig. 1	26	VSDTC144EK / -1
Fig. 1	16	VSDTA144EK / -1
Fig. 1	BQ	VS3SC2412KQ-1
Fig. 1	FQ	VS2SA1037KQ-1

MARK ★: SPARE PARTS-DELIVERY SECTION.

Ref. No.	Part No.	★	Description	Code
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PRINTED WIRING BOARD ASSEMBLIES

(NOT REPLACEMENT ITEM)

DUNTK5101TEV3	-	Main Unit (VC-M21HM)	—
DUNTK5101TEV7	-	Main Unit (VC-M41HM)	—
DUNTK5132TEV1	-	Terminal Unit	—
DUNTK5133TEV0	-	Operation Unit	—

Ref. No.	Part No.	★	Description	Code
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DUNTK5101TEV3 (VC-M21HM)

DUNTK5101TEV7 (VC-M41HM)

MAIN UNIT



TUNER AND ASSEMBLY

CNV4451	RCNVR0168UMZZ	U	RF Converter	
TU1551	VTUOF4EK-721F	U	Tuner	
UNT1501	RiFU-0645GEZZ	U	IF-PACK Unit	

INTEGRATED CIRCUITS

IC202	VHiMN3881S/1E	J	CCD	AL
IC301	VHiSTV5727/-1	J	REC/PB Amp. (VC-M21HM)	AG
IC301	VHiSTV5725/-1	J	REC/PB Amp. (VC-M41HM)	AK
IC401	VHiHA8201CF-1	J	Y/C Processor	AW
IC701	VHiBA15218FIE	J	I.C.	AF
IC801	RH-iX0898GEZZ	J	Syscon/Servo/Timer	
IC802	VHiPST600H/-1	J	Reset	AE
IC803	VHiBA6209//1E	J	Loading Motor Driver	AG
IC804	VHiST24C04M-1	J	E ² PROM	AM
IC951	VHiUZT33///-1	J	I.C.	AC
IC1801	VHiSDA5649X1E	J	VPS/PDC	AZ
IC2401	VHiLA7217M/-1	J	I.C.	AG
IC5001	VHiMN12510F-1	J	FIP Driver	AM
IC5901	RH-iX1054GEZZ	J	OSD	AM

TRANSISTORS

Q202	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q203	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q204	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q205	VS2SA1037KQ-1	J	2SA1037KQ	AA
Q210	VSDTC144EK/-1	J	DTC144EK	AB
Q301	VS2SC2412KQ-1	J	2SC2412KQ (VC-M41HM)	AA
Q302	VSDTC124EK/-1	J	DTC124EK (VC-M41HM)	AB
Q303	VSDTC124EK/-1	J	DTC124EK (VC-M41HM)	AB
Q304	VSDTC124EK/-1	J	DTC124EK (VC-M41HM)	AB
Q305	VS2SC2412KQ-1	J	2SC2412KQ(VC-M41HM)	AA
Q306	VS2SC2412KQ-1	J	2SC2412KQ (VC-M41HM)	AA
Q540	VSDTC144EK/-1	J	DTC144EK (VC-M41HM)	AB
Q543	VSDTC144EK/-1	J	DTC144EK (VC-M41HM)	AB
Q545	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q546	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q547	VSDTC144EK/-1	J	DTC144EK	AB
Q603	VS2C3939SQR-1	J	2SC3939SQR	AC
Q702	VS2SA1037KQ-1	J	2SA1037KQ	AA
Q703	VS2SA1037KQ-1	J	2SA1037KQ	AA
Q801	VS2SA1037KQ-1	J	2SA1037KQ	AA
Q802	VSDTC114EK/-1	J	DTC114EK	AB
 Q901	VS2SC4231QR-3	J	2SC4231QR	AH
 Q903	VS2SD2144S/-1	J	2SD2144S	AC
Q921	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q922	VS2SA1037KQ-1	J	2SA1037KQ	AA

Ref. No.	Part No.	★	Description	Code
TRANSISTORS (Continued)				
Q923	VS2SA1037KQ-1	J	2SA1037KQ	AA
Q956	VS2SC2001LK-1	J	2SC2001LK	AA
Q957	VSDTA144EK/-1	J	DTA144EK	AC
Q958	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q963	VS2SC2001LK-1	J	2SC2001LK	AA
Q964	VS2SC2001LK-1	J	2SC2001LK	AA
Q965	VSDTA144EK/-1	J	DTA144EK	AC
Q966	VSDTC114EK/-1	J	DTC114EK	AB
Q970	VS2SC2001LK-1	J	2SC2001LK	AA
Q990	VS2SA1037KQ-1	J	2SA1037KQ	AA
Q2401	VS2SA1037KQ-1	J	2SA1037KQ	AA
Q4401	VS2SA1037KQ-1	J	2SA1037KQ	AA
Q5901	VS2SA1037KQ-1	J	2SA1037KQ	AA

DIODES

D540	RH-DX0053GEZZ	J	1SS132 (VC-M41HM)	AA
D543	RH-DX0053GEZZ	J	1SS132	AA
D701	RH-DX0053GEZZ	J	1SS132	AA
D702	RH-DX0053GEZZ	J	1SS132	AA
D703	RH-DX0053GEZZ	J	1SS132	AA
D704	RH-DX0053GEZZ	J	1SS132	AA
D705	RH-DX0053GEZZ	J	1SS132	AA
D706	RH-DX0053GEZZ	J	1SS132	AA
D707	RH-DX0053GEZZ	J	1SS132	AA
D801	RH-DX0053GEZZ	J	1SS132	AA
D802	RH-DX0053GEZZ	J	1SS132	AA
D851	RH-PX0234GEZZ	J	Cassette LED	AD
D852	RH-PX0238GEZZ	J	Cam Switch A	AF
D853	RH-PX0238GEZZ	J	Cam Switch B	AF
D854	RH-PX0232GEZZ	J	Supply Reel Sensor	AF
D855	RH-PX0232GEZZ	J	Take-up Reel Sensor	AF
⚠ D901	RH-DX0083GEZZ	J	Diode Bridge	AC
⚠ D902	VHDERA2206/-1	J	ERA2206	AC
⚠ D903	RH-DX0220CEZZ	J	Diode	AB
⚠ D904	RH-DX0053GEZZ	J	1SS132	AA
⚠ D907	RH-EX0281CEZZ	J	Zener Diode	AA
⚠ D908	RH-DX0053GEZZ	J	1SS132	AA
D921	VHDFR103///-1	J	FR103	AC
D922	VHD1SS147///-1	J	1SS147	AA
D923	VHD30DF2-FC-1	J	30DF2	AE
D924	VHDRK34///-1	J	RK34	AE
D925	VHD1SS147///-1	J	1SS147	AA
D926	RH-EX0807GEZZ	J	Zener Diode	AC
D927	RH-EX0294CEZZ	J	Zener Diode	AA
D928	RH-DX0053GEZZ	J	1SS132	AA
D929	RH-DX0053GEZZ	J	1SS132	AA
D930	RH-EX0301CEZZ	J	Zener Diode	AA
D954	RH-EX0316CEZZ	J	Zener Diode	AA
D961	RH-DX0053GEZZ	J	1SS132	AA
D964	RH-EX0291CEZZ	J	Zener Diode	AA
D965	VHD1A3-F///-1	J	1A3	AA
D966	VHD1A3-F///-1	J	1A3	AA
D967	RH-DX0053GEZZ	J	1SS132	AA
D2401	RH-DX0053GEZZ	J	1SS132	AA

Ref. No.	Part No.	★	Description	Code
DIODES (Continued)				
D5001	RH-DX0053GEZZ	J	1SS132	AA
D5002	RH-DX0053GEZZ	J	1SS132	AA
D5003	RH-DX0053GEZZ	J	1SS132	AA
D5004	RH-DX0053GEZZ	J	1SS132	AA
⚠ IC901	RH-FX0005GEZZ	J	Photo Coupler	AE
Q851	RH-PX0233GEZZ	J	Start Sensor	AD
Q852	RH-PX0233GEZZ	J	End Sensor	AD

PACKAGED CIRCUITS

X501	RCRSB0166GEZZ	J	Crystal,4.43MHz	AG
X801	RCRSB0190GEZZ	J	Crystal,8MHz	AM
X5901	RCRSB0184GEZZ	J	Crystal	AM

COILS AND TRANSFORMERS

FL2401	RFILA0020CEZZ	J	Filter	AD
FL5001	RFILA0115GEZZ	J	Filter	AC
L201	VP-XF151K0000	J	150μH	AB
L202	VP-XF150K0000	J	15μH	AB
L203	VP-XF330K0000	J	33μH	AB
L204	VP-XF120K0000	J	12μH	AB
L205	VP-XF820K0000	J	82μH	AB
L206	VP-DF1R2M0000	J	1.2μH	AB
L207	VP-XF560K0000	J	56μH	AB
L208	VP-XF151K0000	J	150μH	AB
L209	VP-XF560K0000	J	56μH	AB
L210	VP-XF151K0000	J	150μH	AB
L301	VP-MK101K0000	J	100μH	AB
L501	VP-MK561K0000	J	560μH	AB
L504	VP-XF150J0000	J	15μH	AB
L505	VP-XF100K0000	J	10μH	AB
L506	VP-XF390K0000	J	39μH	AB
L509	VP-XF151K0000	J	150μH	AB
L511	VP-XF680K0000	J	68μH	AB
L602	VP-DF221K0000	J	220μH	AB
⚠ L901	RCiLF0227GEZZ	J	Coil	AM
L921	RCiLP0171CEZZ	J	Coil	AD
L922	RCiLP0175CEZZ	J	Coil	AD
L1551	VP-XF120K0000	J	12μH	AB
L1552	VP-XF120K0000	J	12μH	AB
L1553	VP-XF120K0000	J	12μH	AB
L1554	VP-XF120K0000	J	12μH	AB
L1555	VP-XF120K0000	J	12μH	AB
L1801	VP-DF8R2K0000	J	8.2μH	AB
L1802	VP-DF8R2K0000	J	8.2μH	AB
L4401	VP-MK221K0000	J	220μH	AB
L4402	VP-XF270K0000	J	27μH	AB
L5901	VP-XF150K0000	J	15μH	AB
L5902	VP-DF101K0000	J	100μH	AB
L5903	VP-DF101K0000	J	100μH	AB
T601	RTRNH0053GEZZ	J	OSC. Transformer	AE
⚠ T901	RTRNZ0021AJZZ	U	Transformer	

Ref. No.	Part No.	★	Description	Code	Ref. No.	Part No.	★	Description	Code
CAPACITORS					CAPACITORS (Continued)				
C201	VCKYD41HB471K	J	470p 50V Ceramic	AA	C311	VCCCCY1HH270J	J	27p 50V Ceramic (VC-M41HM)	AA
C202	VCKYD41HB391K	J	390p 50V Ceramic	AA	C312	VCCCCY1HH270J	J	27p 50V Ceramic (VC-M41HM)	AA
C203	VCCCCY1HH330J	J	33p 50v Ceramic	AA	C313	VCKYCY1HF103Z	J	0.01 50V Ceramic (VC-M41HM)	AA
C204	VCCSD41HL150J	J	15p 50V Ceramic	AA	C314	VCKYCY1HF103Z	J	0.01 50V Ceramic (VC-M41HM)	AA
C205	VCCSD41HL330J	J	33p 50V Ceramic	AA	C321	VCKYCY1EF104Z	J	0.1 25V Ceramic (VC-M41HM)	AA
C206	VCCSD41HL470J	J	47p 50V Ceramic	AA	C324	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C208	VCCSD41HL560J	J	56p 50V Ceramic	AA	C325	VCKYCY1EF104Z	J	0.1 25V Ceramic (VC-M41HM)	AA
C209	VCKYCY1CF334Z	J	0.33 16V Ceramic	AA	C326	VCKYCY1HF103Z	J	0.01 50V Ceramic (VC-M41HM)	AA
C210	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	C327	VCKYCY1HB102K	J	1000p 50V Ceramic	AA
C211	VCCCPA1HH470J	J	47p 50V Ceramic	AA	C328	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C212	VCEAEA1HW474M	J	0.47 50V Electrolytic	AB	C328	VCKYCY1HF223Z	J	0.022 50V Ceramic (VC-M41HM)	AB
C213	RC-FZ5102BMNK	U	Capacitor		C329	VCKYCY1HF223Z	J	0.022 50V Ceramic	AB
C214	VCEAEA1HW224M	J	0.22 50V Electrolytic	AB	C341	VCKYD41EB223K	J	0.022 25V Ceramic	AA
C215	VCCCPA1HH101J	J	100p 50V Ceramic	AA	C501	VCKYCY1HB332K	J	3300p 50V Ceramic	AA
C216	VCCCCY1HH100D	J	10p 50V Ceramic	AA	C503	VCKYCY1HF103N	J	0.01 50V Ceramic	AA
C217	VCEAEA1HW105W	J	1 50V Ceramic	AA	C504	VCEAEA0JW476M	J	47 6.3V Electrolytic	AB
C218	VCKYD41CY103N	J	0.01 16V Ceramic	AA	C505	VCKYCY1HF473Z	J	0.047 50V Ceramic	AA
C219	VCKYCY1HF223Z	J	0.022 50V Ceramic	AB	C506	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C220	VCEAEM1HW335M	J	3.3 50V Electrolytic	AB	C508	VCKYD41CY103N	J	0.01 16V Ceramic	AA
C221	VCKYCY1HF223Z	J	0.022 50V Ceramic	AB	C509	VCKYCY1EB153K	J	0.015 25V Ceramic	AA
C222	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA	C510	VCEAGA1HW335M	J	3.3 50V Electrolytic	AB
C223	VCEAEA1HW335M	J	3.3 50V Electrolytic	AB	C511	VCCCCY1HH330J	J	33p 50v Ceramic	AA
C224	VCEAEA1HW225M	J	2.2 50V Electrolytic	AB	C512	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C226	VCEAEA1HW474M	J	0.47 50V Electrolytic	AB	C513	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C228	VCEAEA1HW224M	J	0.22 50V Electrolytic	AB	C514	VCKYCY1HF333Z	J	0.033 50V Ceramic	AA
C229	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA	C515	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C230	VCEAEA0JW476M	J	47 6.3V Electrolytic	AB	C516	VCEAEA1HW475M	J	4.7 50V Electrolytic	AB
C232	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	C517	VCCCCY1HH180J	J	18p 50V Ceramic	AA
C233	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	C520	VCEAEA1HW474M	J	0.47 50V Electrolytic	AB
C234	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	C521	VCKYCY1HF223Z	J	0.022 50V Ceramic	AB
C235	VCEAEM1CW106M	J	10 16V Electrolytic	AB	C522	VCKYCY1AF105Z	J	1 25V Ceramic	AC
C236	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA	C523	VCEAEA1CW106M	J	10 16V Electrolytic	AB
C237	VCCCCY1HH330J	J	33p 50v Ceramic	AA	C525	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C238	VCCCD41HH4R7K	J	4.7p 50V Ceramic	AA	C526	VCCCCY1HH680J	J	68p 50V Ceramic	AA
C239	VCCCCY1HH560J	J	56p 50V Ceramic	AA	C527	VCCCCY1HH470J	J	47p 50V Ceramic	AA
C240	VCCCCY1HH391J	J	390p 50V Ceramic	AA	C528	VCCCCY1HH560J	J	56p 50V Ceramic	AA
C242	VCCCCY1HH560J	J	56p 50V Ceramic	AA	C529	VCEAEA1HW475M	J	4.7 50V Electrolytic	AB
C243	VCCCCY1HH330J	J	33p 50V Ceramic	AA	C530	VCCCPA1HH121J	J	120p 50V Ceramic	AA
C244	VCCCCY1HH221J	J	220p 50V Ceramic	AA	C531	VCCCCY1HH1R0C	J	1p 50V Ceramic	AA
C246	VCKYCY1CF473Z	J	0.047 16V Ceramic	AA	C535	VCCCCY1HH181J	J	180p 50V Ceramic	AA
C301	VCEAEM1CW476M	J	47 16V Electrolytic	AB	C536	VCCCCY1HH181J	J	180p 50V Ceramic	AA
C302	VCKYCY1EF104Z	J	0.1 25V Ceramic (VC-M41HM)	AA	C537	VCKYD41CY103N	J	0.01 16V Ceramic	AA
C303	VCKYCY1CF224Z	J	0.22 16V Ceramic (VC-M41HM)	AA	C541	VCKYD41HF104Z	J	0.1 50V Ceramic	AA
C304	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA	C542	VCCCCY1HH330J	J	33p 50V Ceramic	AA
C305	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA	C543	VCKYCY1HB561K	J	560p 50V Ceramic	AA
C306	VCKYD41HF104Z	J	0.1 50V Ceramic	AA	C590	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C307	VCKYCY1EF104Z	J	0.1 25V Ceramic (VC-M41HM)	AA	C621	VCEAGA1CW476M	J	47 16V Electrolytic	AB
C308	VCKYCY1EF104Z	J	0.1 25V Ceramic (VC-M41HM)	AA					
C309	VCCCCY1HH470J	J	47p 50V Ceramic	AA					
C310	VCCCCY1HH470J	J	47p 50V Ceramic	AA					

Ref. No.	Part No.	★	Description	Code	Ref. No.	Part No.	★	Description	Code
CAPACITORS (Continued)					CAPACITORS (Continued)				
C622	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	C826	VCE9GA1HW105M	J 1	50V Elect. (N.P)	AB
C623	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	C829	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C624	VCQPSA2AA562J	J	5600p 100V Mylar	AC	C830	VCKYCY1HB102K	J	1000p 50V Ceramic	AA
C625	VCRYP1HA221J	J	220p 50V	AB	C831	VCKYCY1HB102K	J	1000p 50V Ceramic	AA
C701	VCKYCY1HB102K	J	1000p 50V Ceramic	AA	C832	VCKYCY1HB102K	J	1000p 50V Ceramic	AA
C702	VCKYCY1CF334Z	J	0.33 16V Ceramic	AA	C833	VCKYCY1HB102K	J	1000p 50V Ceramic	AA
C707	VCKYCY1HB102K	J	1000p 50V Ceramic	AA	⚠ C901	RC-FZ029CUMZZ	U	Capacitor	
C709	VCEAEA0JW476M	J	47 6.3V Electrolytic	AB	⚠ C907	RC-EZ0440GEZZ	J	Capacitor	AH
C710	VCEAEM0JW476M	J	47 6.3V Electrolytic	AB	⚠ C908	VCFYAA2GA333K	J	0.033 400V	AD
C711	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	⚠ C909	RC-KZ0112CEZZ	J	Capacitor	AB
C712	VCEAEA1HW225M	J	2.2 50V Electrolytic	AB	⚠ C910	VCKYPA2HB472K	J	4700p 500V Ceramic	AB
C713	VCEAEA1HW225M	J	2.2 50V Electrolytic	AB	⚠ C912	VCQYTA1HM473J	J	0.047 50V Mylar	AA
C714	VCEAEA1CW226M	J	22 16V Electrolytic	AB	⚠ C913	RC-FZ5333BMNK	U	Capacitor	
C715	VCKYCY1HB102K	J	1000p 50V Ceramic	AA	⚠ C915	RC-KZ0096GEZZ	J	1000p 400V Ceramic	AD
C716	VCEAEA1CW226M	J	22 16V Electrolytic	AB	C921	VCEAGA0JW107M	J	100 6.3V Electrolytic	AB
C717	VCEAEA1HW105M	J	1 50V Electrolytic	AB	C922	VCEAGA1HW106M	J	10 50V Electrolytic	AC
C719	VCEAEA1HW105M	J	1 50V Electrolytic	AC	C923	VCEAVA1VN477M	J	470 35V Electrolytic	AD
C720	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	C924	RC-QZ0104GEZZ	J	Capacitor	AC
C721	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	C925	VCEAVA1AN477M	J	470 10V Electrolytic	AC
C722	VCKYCY1HF104Z	J	0.1 25V Ceramic	AA	C927	RC-FZ5103BMNK	U	Capacitor	
C723	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	C928	VCEAGA1EW337M	J	330 25V Electrolytic	AC
C724	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	C929	VCEAGA1AW337M	J	330 10V Electrolytic	AB
C725	VCKYCY1HB472K	J	4700p 50V Ceramic	AA	C930	VCEAGA1HW476M	J	47 50V Electrolytic	AB
C726	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	C931	VCEAGA1HW105M	J	1 50V Electrolytic	AC
C727	VCEAEA0JW107M	J	100 6.3V Electrolytic	AB	C932	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C728	VCKYCY1HB472K	J	4700p 50V Ceramic	AA	C935	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C729	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	C952	VCEAGA1HW105M	J	1 50V Electrolytic	AC
C730	VCFAFA0JW336M	J	33.6 6.3V Electrolytic	AB	C957	VCEAGA1CW106M	J	10 16V Electrolytic	AA
C731	VCKYCY1HB102K	J	1000p 50V Ceramic	AA	C958	VCEAGA1HW105M	J	1 50V Electrolytic	AC
C732	RC-FZ5334BMNK	U	Capacitor		C961	VCEAEM1CW106M	J	10 16V Electrolytic	AB
C733	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA	C989	VCKYPA1HF223Z	J	0.022 50V Ceramic	AA
C734	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA	C1552	VCEAGA1CW107M	J	100 16V Electrolytic	AB
C737	VCKYCY1HB102K	J	1000p 50V Ceramic	AA	C1553	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C740	VCKYCY1HB472K	J	4700p 50V Ceramic	AA	C1554	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C750	VCEAEM1CW476M	J	47 16V Electrolytic	AB	C1555	VCEAGA1CW476M	J	47 16V Electrolytic	AB
C801	VCCCCY1HH470J	J	47p 50V Ceramic	AA	C1556	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C802	VCCCCY1HH470J	J	47p 50V Ceramic	AA	C1557	VCEAGA1CW106M	J	10 16V Electrolytic	AA
C803	VCCCCY1HH470J	J	47p 50V Ceramic	AA	C1561	VCEAEA1CW106M	J	10 16V Electrolytic	AB
C804	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA	C1801	VCKYCY1HF332Z	J	0.033 50V Ceramic	AA
C805	VCEAGA1HW105M	J	1 50V Electrolytic	AC	C1802	VCKYCY1HB222K	J	2200p 50V Ceramic	AA
C807	VCCCCY1HH220J	J	22p 50V Ceramic	AA	C1803	VCKYCY1HF333Z	J	0.033 50V Ceramic	AA
C808	VCCCCY1HH220J	J	22p 50V Ceramic	AA	C1804	VCCCCY1HH151J	J	150p 50V Ceramic	AA
C811	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	C1805	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C812	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	C1806	VCEAGA0JW476M	J	47 6.3V Electrolytic	AB
C813	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	C2202	VCE9EM1HW335M	J	3.3 50V Elect. (N.P)	AD
C815	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	C2401	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C816	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	C2402	VCEAGA1CW106M	J	10 16V Electrolytic	AA
C817	VCKYCY1HB102K	J	1000p 50V Ceramic	AA	C2403	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
			(VC-M41HM)		C2404	VCEAGA1HW105M	J	1 50V Electrolytic	AC
C819	VCEAGA0JW108M	J	1000 6.3V Electrolytic	AC	C2405	VCKYCY1HB102K	J	1000p 50V Ceramic	AA
C820	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA	C2406	VCKYCY1HF223Z	J	0.022 50V Ceramic	AB
C821	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	C2407	RC-FZ5563BMNK	U	Capacitor	
C823	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	C2408	VCEAGA1HW105M	J	1 50V Electrolytic	AC
C824	VCEAGA1CW476M	J	47 16V Electrolytic	AB	C4401	VCEAGA1CW107M	J	100 16V Electrolytic	AB
C825	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA	C4402	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA

Ref. No.	Part No.	★	Description	Code	Ref. No.	Part No.	★	Description	Code
CAPACITORS (Continued)					RESISTORS (Continued)				
C4404	VCEAGA1CW476M	J 47	16V Electrolytic	AB	R312	VRS-CY1JF152J	J 1.5k	1/16W Metal Oxide (VC-M41HM)	AA
C5001	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA	R313	VRS-CY1JF822J	J 8.2k	1/16W Metal Oxide (VC-M41HM)	AA
C5002	VCEAGA0JW476M	J 47	6.3V Electrolytic	AB	R314	VRS-CY1JF152J	J 1.5k	1/16W Metal Oxide (VC-M41HM)	AA
C5003	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA	R315	VRS-CY1JF562J	J 5.6k	1/16W Metal Oxide (VC-M41HM)	AA
C5004	VCCCCY1HH470J	J 47p	50V Ceramic	AA	R316	VRS-CY1JF103J	J 10k	1/16W Metal Oxide (VC-M41HM)	AA
C5010	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA	R317	VRD-RA2BE103J	J 10k	1/8W Carbon	AA
C5501	VCEAGA0JW476M	J 47	6.3V Electrolytic	AB	R318	VRD-RA2BE123J	J 12k	1/8W Carbon	AA
C5901	VCCCCY1HH330J	J 33p	50 Ceramic	AA	R321	VRS-CY1JF331J	J 330	1/16W Metal Oxide (VC-M41HM)	AA
C5902	VCCCCY1HH330J	J 33p	50 Ceramic	AA	R322	VRS-CY1JF821J	J 820	1/16W Metal Oxide	AA
C5903	VCCCCY1HH470J	J 47p	50 Ceramic	AA	R501	VRS-CY1JF271J	J 270	1/16W Metal Oxide	AA
C5906	VCEAEA1HW105M	J 1	50V Electrolytic	AB	R502	VRS-CY1JF821J	J 820	1/16W Metal Oxide	AA
C5907	VCCCCY1HH470J	J 47p	50V Ceramic	AA	R506	VRS-CY1JF103J	J 10k	1/16W Metal Oxide	AA
C5908	VCKYCY1EF104Z	J 0.1	25V ceramic	AA	R507	VRS-CY1JF103J	J 10k	1/16W Metal Oxide	AA
C5909	VCCCCY1HH100J	J 10p	50V Ceramic	AA	R508	VRS-CY1JF122J	J 1.2k	1/16W Metal Oxide	AA
C5910	VCCCCY1HH8R0D	J 8p	50V Ceramic	AA	R510	VRS-CY1JF273J	J 27k	1/16W Metal Oxide	AA
C5911	VCEAGAOJW476M	J 47	6.3V Electrolytic	AB	R511	VRS-CY1JF472J	J 4.7k	1/16W Metal Oxide	AA
C5912	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA	R513	VRS-CY1JF102J	J 1k	1/16W Metal Oxide	AA
C5913	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA	R515	VRS-CY1JF102J	J 1k	1/16W Metal Oxide	AA
C5914	VCEAEA1CW476M	J 47	16V Electrolytic	AB	R517	VRS-CY1JF102J	J 1k	1/16W Metal Oxide	AA
RESISTORS					R520	VRD-RA2BE102J	J 1k	1/8W Carbon	AA
R201	VRS-CY1JF681J	J 680	1/16W Metal Oxide	AA	R523	VRD-RA2BE103J	J 10k	1/8W Carbon	AA
R203	VRS-CY1JF822J	J 8.2k	1/16W Metal Oxide	AA	R524	VRS-CY1JF103J	J 10k	1/16W Metal Oxide	AA
R205	VRS-CY1JF822J	J 8.2k	1/16W Metal Oxide	AA	R542	VRS-CY1JF102J	J 1k	1/16W Metal Oxide	AA
R206	VRS-CY1JF561J	J 560	1/16W Metal Oxide	AA	R543	VRS-CY1JF681J	J 680	1/16W Metal Oxide	AA
R207	VRS-CY1JF561J	J 560	1/16W Metal Oxide	AA	R544	VRS-CY1JF473J	J 47k	1/16W Metal Oxide	AA
R208	VRS-CY1JF391J	J 390	1/16W Metal Oxide	AA	R545	VRS-CY1JF223J	J 22k	1/16W Metal Oxide	AA
R209	VRS-CY1JF821J	J 820	1/16W Metal Oxide	AA	R601	VRS-CY1JF100J	J 10	1/16W Metal Oxide	AA
R210	VRS-CY1JF102J	J 1k	1/16W Metal Oxide	AA	R631	VRS-CY1JF470J	J 47	1/16W Metal Oxide	AA
R211	VRS-CY1JF221J	J 220	1/16W Metal Oxide	AA	R632	VRS-CY1JF682J	J 6.8k	1/16W Metal Oxide	AA
R212	VRS-CY1JF152J	J 1.5k	1/16W Metal Oxide	AA	R633	VRG-SC2EB4R7J	J 4.7	1/4W Fuse Resistor	AB
R213	VRS-CY1JF222J	J 2.2k	1/16W Metal Oxide	AA	R635	VRD-RA2BE273J	J 27k	1/8W Carbon	AA
R214	VRS-CY1JF103J	J 10k	1/16W Metal Oxide	AA	R643	VRD-RA2BE272J	J 2.7k	1/8W Carbon	AA
R215	VRS-CY1JF222J	J 2.2k	1/16W Metal Oxide	AA	R701	VRS-CY1JF272J	J 2.7k	1/16W Metal Oxide	AA
R216	VRD-RA2BE222J	J 2.2k	1/8W Carbon	AA	R703	VRS-CY1JF473J	J 47k	1/16W Metal Oxide	AA
R217	VRS-CY1JF102J	J 1k	1/16W Metal Oxide	AA	R705	VRD-RA2BE155J	J 1.5M	1/8W Carbon	AA
R219	VRS-CY1JF122J	J 1.2k	1/16W Metal Oxide	AA	R707	VRD-RA2BE102J	J 1k	1/8W Carbon	AA
R220	VRS-CY1JF152J	J 1.5k	1/16W Metal Oxide	AA	R708	VRS-CY1JF103J	J 10k	1/16W Metal Oxide	AA
R226	VRS-CY1JF152J	J 1.5k	1/16W Metal Oxide	AA	R709	VRS-CY1JF103J	J 10k	1/16W Metal Oxide	AA
R228	VRD-RA2BE102J	J 1k	1/8W Carbon	AA	R710	VRS-CY1JF102J	J 1k	1/16W Metal Oxide	AA
R229	VRD-RA2BE103J	J 10k	1/8W Carbon	AA	R711	VRS-CY1JF102J	J 1k	1/16W Metal Oxide	AA
R230	VRS-CY1JF103J	J 10k	1/16W Metal Oxide	AA	R713	VRS-CY1JF102J	J 1k	1/16W Metal Oxide	AA
R301	VRS-CY1JF682J	J 6.8k	1/16W Metal Oxide	AA	R714	VRS-CY1JF562J	J 5.6k	1/16W Metal Oxide	AA
R302	VRS-CY1JF221J	J 220	1/16W Metal Oxide	AA	R715	VRS-CY1JF682J	J 6.8k	1/16W Metal Oxide	AA
R303	VRS-CY1JF221J	J 220	1/16W Metal Oxide	AA	R716	VRS-CY1JF393J	J 39k	1/16W Metal Oxide	AA
R304	VRD-RA2BE682J	J 6.8k	1/8W Carbon	AA	R717	VRS-CY1JF183J	J 18k	1/16W Metal Oxide	AA
R305	VRD-RA2BE272J	J 2.7k	1/8W Carbon	AA	R718	VRS-CY1JF102J	J 1k	1/16W Metal Oxide	AA
R306	VRS-CY1JF103J	J 10k	1/16W Metal Oxide	AA	R719	VRS-CY1JF823J	J 82k	1/16W Metal Oxide	AA
R307	VRD-RA2BE223J	J 22k	1/8W Carbon	AA	R720	VRS-CY1JF153J	J 15k	1/16W Metal Oxide	AA
R308	VRS-CY1JF682J	J 6.8k	1/16W Metal Oxide (VC-M41HM)	AA	R723	VRS-CY1JF154J	J 150k	1/16W Metal Oxide	AA
R311	VRS-CY1JF822J	J 8.2k	1/16W Metal Oxide (VC-M41HM)	AA					

Ref. No.	Part No.	★	Description	Code
RESISTORS (Continued)				
R724	VRS-CY1JF154J	J	150k 1/16W Metal Oxide	AA
R725	VRS-CY1JF273J	J	27k 1/16W Metal Oxide	AA
R726	VRS-CY1JF564J	J	560k 1/16W Metal Oxide	AA
R727	VRS-CY1JF272J	J	2.7k 1/16W Metal Oxide	AA
R728	VRS-CY1JF224J	J	220k 1/16W Metal Oxide	AA
R729	VRS-CY1JF683J	J	68k 1/16W Metal Oxide	AA
R730	VRS-CY1JF334J	J	330k 1/16W Metal Oxide	AA
R731	VRS-CY1JF392J	J	3.9k 1/16W Metal Oxide	AA
R732	VRS-CY1JF473J	J	47k 1/16W Metal Oxide	AA
R733	VRD-RA2BE155J	J	1.5M 1/8W Carbon	AA
R734	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA
R735	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R736	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R737	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R738	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA
R739	VRS-CY1JF473J	J	47k 1/16W Metal Oxide	AA
R741	VRS-CY1JF563J	J	56k 1/16W Metal Oxide	AA
R742	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA
R743	VRS-CY1JF564J	J	560k 1/16W Metal Oxide	AA
R746	VRD-RA2BE102J	J	1k 1/8W Carbon	AA
R747	VRD-RA2BE103J	J	10k 1/8W Carbon	AA
R748	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA
R752	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R801	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R802	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R804	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R805	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R806	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R807	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R809	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R811	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R812	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R813	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R814	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R815	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA
R821	VRS-CY1JF152J	J	1.5k 1/16W Metal Oxide	AA
R822	VRS-CY1JF183J	J	18k 1/16W Metal Oxide	AA
R824	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R825	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R826	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R827	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R831	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R832	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R840	VRG-SC2EB2R2J	J	2.2 1/4W Fuse Resistor	AC
R851	VRD-RA2EE151J	J	150 1/4W Carbon	AA
R854	VRS-CY1JF123J	J	12k 1/16W Metal Oxide	AA
R855	VRS-CY1JF123J	J	12k 1/16W Metal Oxide	AA
R856	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R857	VRS-CY1JF271J	J	270 1/16W Metal Oxide	AA
R858	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA
R859	VRS-CY1JF271J	J	270 1/16W Metal Oxide	AA
R860	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA
R861	VRD-RA2BE221J	J	220 1/8W Carbon	AA
R862	VRS-CY1JF154J	J	150k 1/16W Metal Oxide	AA
R863	VRD-RA2BE221J	J	220 1/8W Carbon	AA

Ref. No.	Part No.	★	Description	Code
RESISTORS (Continued)				
R864	VRS-CY1JF154J	J	150k 1/16W Metal Oxide	AA
△ R901	VRD-RA2HD105J	J	1M 1/2W Carbon	AA
△ R902	VRC-UA2HG685K	J	6.8M 1/2W Solid	AA
△ R903	VRC-UA2HG685K	J	6.8M 1/2W Solid	AA
△ R904	RR-WZ0003GEZZ	J	Resistor	AD
△ R905	RR-SZ0007GEZZ	J	Resistor	AB
△ R906	VRD-RA2HD154J	J	150k 1/2W Carbon	AA
△ R907	VRD-RA2HD154J	J	150k 1/2W Carbon	AA
△ R908	VRS-VU3AB820J	J	82 1W Metal Oxide	AB
△ R916	VRD-RA2EE821J	J	820 1/4W Carbon	AA
R921	VRG-SC2EB1R0J	J	1 1/4W Fuse Resistor	AB
R922	VRD-RA2HD100J	J	10 1/2W Carbon	AA
R924	VRG-SC2EB100J	J	10 1/4W Fuse Resistor	AB
R925	VRD-RA2BE221J	J	220 1/8W Carbon	AA
R926	VRS-CY1JF221J	J	220 1/16W Metal Oxide	AA
R927	VRD-RA2BE272J	J	2.7k 1/8W Carbon	AA
R928	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R929	VRS-CY1JF183J	J	18k 1/16W Metal Oxide	AA
R930	VRS-CY1JF392J	J	3.9k 1/16W Metal Oxide	AA
R931	VRS-CY1JF682J	J	6.8k 1/16W Metal Oxide	A.
R932	VRS-CY1JF221J	J	220 1/16W Metal Oxide	AA
R933	VRD-RA2BE222J	J	2.2k 1/8W Carbon	AA
R952	VRD-RA2HD561J	J	560 1/2W Carbon	AA
R963	VRS-CY1JF330J	J	33 1/16W Metal Oxide	AA
R964	VRD-RA2HD472J	J	4.7k 1/2W Carbon	AA
R965	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA
R966	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R967	VRS-CY1JF183J	J	18k 1/16W Metal Oxide	AA
R971	VRD-RA2HD561J	J	560 1/2W Carbon	AA
R972	VRD-RA2BER56J	J	0.56 1/8W Carbon	AA
R973	VRD-RA2BER56J	J	0.56 1/8W Carbon	AA
R976	VRS-CY1JF472J	J	4.7k 1/16W Metal Oxide	AA
R979	VRD-RA2EE391J	J	390 1/4W Carbon	AA
R980	VRS-CY1JF473J	J	47k 1/16W Metal Oxide	AA
R981	VRS-CY1JF183J	J	18k 1/16W Metal Oxide	AA
R982	VRD-RA2EE391J	J	390 1/4W Carbon	AA
R983	VRS-CY1JF183J	J	18k 1/16W Metal Oxide	AA
R989	VRD-RA2BE333J	J	33k 1/8W Carbon	AA
R990	VRS-CY1JF123J	J	12k 1/16W Metal Oxide	AA
R991	VRD-RA2BE472J	J	4.7k 1/8W Carbon	AA
R1551	VRS-CY1JF334J	J	330k 1/16W Metal Oxide	AA
R1552	VRS-CY1JF474J	J	470k 1/16W Metal Oxide	AA
R1553	VRS-CY1JF101J	J	100 1/16W Metal Oxide	AA
R1801	VRD-RA2BE125J	J	1.2M 1/8 Carbon	AA
R1802	VRS-CY1JF682J	J	6.8k 1/16W Metal Oxide	AA
R1803	VRD-RA2BE125J	J	1.2M 1/8W Carbon	AA
R1804	VRS-CY1JF682J	J	6.8k 1/16W Metal Oxide	AA
R1805	VRD-RA2BE105J	J	1M 1/8W Carbon	AA
R1806	VRS-CY1JF222J	J	2.2k 1/16W Metal Oxide	AA
R1807	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA
R2203	VRS-CY1JF391J	J	390 1/16W Metal Oxide	AA
R2401	VRS-CY1JF392J	J	3.9k 1/16W Metal Oxide	AA
R2402	VRS-CY1JF681J	J	680 1/16W Metal Oxide	AA
R2403	VRS-CY1JF154J	J	150k 1/16W Metal Oxide	AA
R2404	VRS-CY1JF472J	J	4.7k 1/16W Metal Oxide	AA

Ref. No.	Part No.	★	Description	Code
RESISTORS (Continued)				
R2405	VRS-CY1JF472J	J	4.7k 1/16W Metal Oxide	AA
R2406	VRS-CY1JF272J	J	2.7k 1/16W Metal Oxide	AA
R2410	VRS-CY1JF684J	J	680k 1/16W Metal Oxide	AA
R4401	VRD-RA2BE181J	J	180 1/8W Carbon	AA
R4402	VRD-RA2BE151J	J	150 1/8W Carbon	AA
R4405	VRS-CY1JF101J	J	100 1/16W Metal Oxide	AA
R5001	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R5002	VRD-RA2EE1R0J	J	1 1/4W Carbon	AA
R5003	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA
R5004	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA
R5005	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA
R5006	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA
R5007	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA
R5501	VRD-RA2BE331J	J	330 1/8W Carbon	AA
R5901	VRD-RA2BE331J	J	330 1/8W Carbon	AA
R5902	VRS-CY1JF331J	J	330 1/16W Metal Oxide	AA
R5904	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R6609	VRS-CY1JF272J	J	2.7k 1/16W Metal Oxide	AA
R6610	VRS-CY1JF682J	J	6.8k 1/16W Metal Oxide	AA

Ref. No.	Part No.	★	Description	Code
MISCELLANEOUS PARTS (Continued)				
TP5005	QPLGN0247REZZ	J	Plug, 2pin (TP5005-5006)	AA

MISCELLANEOUS PARTS

△	QACCB5011UMZZ	U	AC Cord	
DG5001	VVK10BT143G-1	J	Fluorescent Display Tube	AV
△	F901	QFS-C2026CEZZ	J Fuse, T2AH/250V	AE
FB801	RBLN-0013GEZZ	J	Balun	AB
△	FH901	QFSDH1013CEZZ	J Fuse Holder	AC
△	FH902	QFSDH1014CEZZ	J Fuse Holder	AC
P601	QPLGN0247REZZ	J	Plug, 2pin (AE)	AA
P701	QPLGZ0631GEZZ	J	Plug, 6pin (AO)	AA
P702	QPLGN0247REZZ	J	Plug, 2pin (AL)	AA
P704	QPLGZ1074GEZZ	J	Plug, 10pin (AC)	AC
△	P901	QPLGN0269GEZZ	J Plug, 2pin (PA)	AB
P4401	QPLGZ0531GEZZ	J	Plug, 5pin (AQ)	AB
P4402	QPLGZ1431GEZZ	J	Plug, 14pin (AR)	AC
RMC5501	RRMCU0053GEZZ	J	Remote Receiver	AK
S851	QSW-F0042AJZZ	V	Rec Tip Switch	AG
S5001	QSW-K0002AJZZ	V	Switch, Power	AD
S5002	QSW-K0002AJZZ	V	Switch, Menu	AD
			(VC-M21HM)	
S5003	QSW-K0002AJZZ	J	Switch, Set	AD
			(VC-M21HM)	
S5003	QSW-K0002AJZZ	J	Switch, Menu	AD
			(VC-M41HM)	
S5004	QSW-K0002AJZZ	V	Switch, Set	AD
			(VC-M41HM)	
SC301	QSOCN0494REZZ	J	Socket, 4pin (AH)	AC
			(VC-M21HM)	
SC301	QSOCN0764REZZ	J	Socket, 7pin (AH)	AB
			(VC-M41HM)	
SC601	QSOCN0895REZZ	J	Socket, 8pin (AA)	AC
SC701	QSOCN0795REZZ	J	Socket, 7pin (AD)	AC
TP301	QPLGN0347REZZ	J	Plug, 3pin (TP301-303)	AA
TP1551	QPLGN0347REZZ	J	Plug, 3pin (TP1551-1553)	AA
TP5001	QPLGN0247REZZ	J	Plug, 2pin (TP5001-5002)	AA

— End of Main —

Ref. No.	Part No.	★	Description	Code
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DUNTK5132TEV1
TERMINAL UNIT ASSEMBLY**INTEGRATED CIRCUIT**

IC601	VHIBA7795LS-1	J	Audio Selector	AG
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TRANSISTORS

Q602	VS2C1740SQR1E	J	2SC1740SQR	AC
Q2601	VSDTA144ES/-1	J	DTA144ES	AB
Q2602	VSDTC144ES/-1	J	DTC144ES	AB

DIODES

D2503	RH-EX0646GEZZ	J	Zener Diode	AA
D2504	RH-EX0646GEZZ	J	Zener Diode	AA
D2603	RH-EX0646GEZZ	J	Zener Diode	AA

COILS

L601	VP-YF822J0000	J	8.2mH	AC
L6604	VP-XF3R3K0000	J	3.3μH	AB
L6605	VP-XF3R3K0000	J	3.3μH	AB
L6606	VP-XF3R3K0000	J	3.3μH	AB

CAPACITORS

C601	VCKYPA1HB152K	J	1500p 50V Ceramic	AA
C603	VCEAEA1HW335M	J	3.5 50V Electrolytic	AB
C604	VCEAEA1CW106M	J	10 16V Electrolytic	AB
C605	VCQYTA1HM123J	J	0.012 50V Mylar	AA
C606	VCKYPA1HB272K	J	2700p 50V Ceramic	AA
C607	VCEAEA1CW476M	J	47 16V Electrolytic	AB
C608	VCEAEA1HW104M	J	0.1 50V Electrolytic	AB
C609	VCEAEA1HW104M	J	0.1 50V Electrolytic	AB
C610	VCEAEA1CW226M	J	22 16V Electrolytic	AB
C611	VCEAEA1CW106M	J	10 16V Electrolytic	AB
C612	RC-FZ5153BMNK	U	0.015 Mylar	
C613	RC-FZ5223BMNK	U	0.022 Mylar	
(VC-M41HM)				
C618	VCEAEA1CW106M	J	10 16V Electrolytic	AB
C619	RC-FZ5822BMNK	U	0.012 Mylar	
C626	RC-KZ0029GEZZ	J	Capacitor	AA
C2506	VCEAEA1HW335M	J	3.3 50V Electrolytic	AB
C2507	VCEA2A0JW477M	J	470 6.3V Electrolytic	AB
C2605	VCKYD41HB102K	J	1000p 50V Ceramic	AA

RESISTORS

R602	VRD-RA2BE333J	J	33k 1/8W Carbon	AA
R603	VRD-RA2BE221J	J	220 1/8W Carbon	AA
R604	VRD-RA2BE274J	J	270k 1/8W Carbon	AA
R605	VRD-RA2BE682J	J	6.8k 1/8W Carbon	AA
R606	VRD-RA2BE472J	J	4.7k 1/8W Carbon	AA

(VC-M41HM)

Ref. No.	Part No.	★	Description	Code
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RESISTORS (Continued)

R609	VRD-RA2BE332J	J	3.3k 1/8W Carbon	AA
R610	VRD-RA2BE225J	J	2.2M 1/8W Carbon	AA
R613	VRD-RA2BE333J	J	33k 1/8W Carbon	AA
R614	VRD-RA2BE822J	J	8.2k 1/8W Carbon	AA
R615	VRD-RA2BE473J	J	47k 1/8W Carbon	AA
R616	VRD-RA2BE153J	J	15k 1/8W Carbon	AA
R617	VRD-RA2BE152J	J	1.5k 1/8W Carbon	AA
R618	VRD-RA2BE183J	J	18k 1/8W Carbon	AA
R619	VRD-RA2BE471J	J	470 1/8W Carbon	AA
R620	VRD-RA2BE102J	J	1k 1/8W Carbon	AA
R624	VRD-RA2BE332J	J	3.3k 1/8W Carbon	AA
R625	VRD-RA2BE102J	J	1k 1/8W Carbon	AA
R626	VRD-RA2BE821J	J	820 1/8W Carbon	AA
R629	VRD-RA2BE153J	J	15k 1/8W Carbon	AA
R630	VRD-RA2BE103J	J	10k 1/8W Carbon	AA
R636	VRD-RA2BE562J	J	5.6k 1/8W Carbon	AA
R637	VRD-RA2BE562J	J	5.6k 1/8W Carbon	AA
R638	VRD-RA2BE562J	J	5.6k 1/8W Carbon	AA
R639	VRD-RA2BE153J	J	15k 1/8W Carbon	AA
R2509	VRD-RA2BE750J	J	75 1/8W Carbon	AA
R2510	VRD-RA2BE101J	J	100 1/8W Carbon	AA
R2511	VRD-RA2BE750J	J	75 1/8W Carbon	AA
R2601	VRD-RA2EE821J	J	820 1/4 Carbon	AA
R2609	VRD-RA2BE473J	J	47k 1/8W Carbon	AA
R6501	VRD-RA2BE183J	J	18k 1/8W Carbon	AA
R6618	VRD-RA2BE102J	J	1k 1/8W Carbon	AA
R6619	VRD-RA2BE223J	J	22k 1/8W Carbon	AA
R6620	VRD-RA2BE122J	J	1.2k 1/8W Carbon	AA
R6623	VRD-RA2BE223J	J	22k 1/8W Carbon	AA
R6650	VRD-RA2BE821J	J	820 1/8W Carbon	AA

MISCELLANEOUS PARTS

FB2501	RBLN-0043CEZZ	J	Balun	AB
FB6301	RBLN-0043CEZZ	J	Balun	AB
FB6302	RBLN-0043CEZZ	J	Balun	AB
SC2501	QSOCZ2185GEZZ	J	Socket, 21pin (AUX 1)	
SC6301	QSOCZ0531GEZZ	J	Socket, 3pin (JA)	AC
SC6302	QSOCZ1431GEZZ	J	Socket, 14pin (JB)	AD

— End of Terminal —

DUNTK5133TEV0
OPERATION UNIT

SC8801	QSOCZ0631GEZZ	J	Socket, 6pin (OA)	AB
S8801	QSW-K0002AJZZ	V	Switch, Stop/Eject	AD
S8802	QSW-K0002AJZZ	V	Switch, PLAY	AD
S8803	QSW-K0079GEZZ	J	Switch, REC	AB
S8804	QSW-K0002AJZZ	V	Switch, Pause/Still	AD
S8805	QSW-K0079GEZZ	J	Switch, Ch ⊕	AB
S8806	QSW-K0079GEZZ	J	Switch, Ch ⊖	AB
S8807	QSW-Z0001AJZZ	V	Shuttle Switch	AL

— End of Operation —

Ref. No.	Part No.	★	Description	Code	Ref. No.	Part No.	★	Description	Code
MECHANISM CHASSIS PARTS					46	CLEVP0239AJ00	V	Auto Head Cleaner Ass'y (VC-M41HM)	AF
1	CCHSM9155TEV0	U	Main Chassis Ass'y		47	MSPRT0379AJFJ	V	Loading Double Action Spring	AB
2	NROLP0113AJZZ	V	Supply Impedance Roller	AB	48	NDAIV1065AJ00	V	Reel Disk	AB
3	PCAPS1027AJZZ	V	Supply Impedance Roller Cap	AB	49	MARMP0053AJZZ	V	Reel Idler	AN
4	PGiDS0027AJZZ	V	Supply Impedance Roller Lower Frange	AA	50	MLEVP0240AJZZ	V	Clutch Lever	AB
5	NSFTL0563AJFW	V	Supply Impedance Roller Inner	AE	51	NGERH1221AJZZ	V	Clutch Gear Ass'y	AK
6	LPOLM0050GEZZ	J	Supply Pole Base Ass'y	AM	52	NPLYV0147AJZZ	V	Reel Pulley Ass'y	AP
7	LPOLM0051GEZZ	J	Take-Up Pole Base Ass'y	AM	53	NGERH1224AJZZ	V	Playback Gear	AD
8	NROLP0110GEZZ	J	Guide Roller	AH	54	MLEVP0241AJZZ	V	Clutch Connect Arm	AB
9	MLEVF0414AJZZ	V	Reverse Guide Lever Ass'y	AG	55	MLEVP0252AJZZ	V	Take-Up Main Brake Ass'y	AK
10	MSPRD0147AJFJ	V	Reverse Guide Spring	AB	56	MLEVP0249AJZZ	V	Take-Up Lock Lever	AC
11	PSPAZ0391AJZZ	V	Reverse Guide Spacer	AE	57	MLEVP0253AJZZ	V	Supply Main Brake Lever Ass'y	AH
12	RHEDU0083GEZZ	J	Audio/Control Head	AR	58	MSPRT0380AJFJ	V	Main Brake Spring	AB
13	MLEVF0415AJFW	V	Audio/Control Head Arm	AC	59	NGERH1225AJZZ	V	Cassette Housing Control Drive Gear	AD
14	MSPRD0148AJFJ	V	Audio/Control Head Arm Spring	AB	60	PREFL1004AJZZ	V	Light Guide	AD
15	MSPRC0189AJFJ	V	Azimuth Spring	AB	61	MLEVP0250AJZZ	V	Slow Brake Ass'y	AD
16	RHEDT0032GEZZ	J	Full Erase Head	AK	62	MSPRD0158AJFJ	V	Slow Brake Spring	AB
17	PSPAZ0392AJZZ	V	Audio/Control Head Arm Spacer	AB	63	RMOTN2051GEZZ	J	Capstan Motor	BD
18	QPWBF4735AJZZ	V	Audio/Control Head PWB	AC	64	RMOTM1062GEZZ	J	Loading Motor	AP
19	QSOCN0885REZZ	J	Socket, 8 pin	AB	65	QCNW-0156AJZZ	V	Lead Wire for Loading Motor	AE
20	NBLTK0065AJ00	V	Reel Belt	AE	66	QCNW-0155AJZZ	V	FFC for Audio/Control	AF
21	MLEVF0416GEZZ	J	Pinch Roller Lever Ass'y	AU	67	QCNW-0247AJZZ	V	FFC for Drum Motor	
22	MLEVP0237AJZZ	V	Pinch Double Action Lever	AD	70	PGiDC0052GEFW	J	Drum Base	AK
23	MLEVF0417AJZZ	V	Pinch Drive Lever Ass'y	AG	71	XBPSD30P08J00	J	Drum Base Mounting Screw (SW3P+8S)	AA
24	NGERH1216AJZZ	V	Pinch Drive Cam	AE	72	QBRK0034GEZZ	J	Drum Earth Brush	AD
25	MLEVP0238AJZZ	V	Open Lever	AC	73	MSPRC0194GEFJ	J	Drum Earth Brush Spring	AA
26	MSPRT0377AJFJ	V	Pinch Double Action Spring	AC	74	RMOTP1124GEZZ	J	Drum Drive Motor	
28	MLEVF0418AJZZ	V	Tension Arm Ass'y	AG	75	XBPSD26P06J00	J	Drum Drive Motor Mounting Screw (SW2.6P+6S)	AA
29	LBOSZ1001AJZZ	V	Tension Arm Boss	AB	76	DDRMW0014TEV0	U	Upper and lower drum Ass'y (VC-M21HM)	
30	MSPRT0378AJFJ	V	Tension Spring	AC	76	DDRMW0015TEV0	U	Upper and lower drum Ass'y (VC-M41HM)	
31	LBNDK1008AJZZ	V	Tension Band Ass'y	AG					
32	NSFTP0032AJZZ	V	Tension Pole Adjust Cam	AB					
33	NGERH1217AJ00	V	Master Cam	AE					
34	NPLYV0151AJZZ	V	Motor Pulley	AB					
35	NGERW1058AJZZ	V	Worm Gear	AC					
36	NGERW1052AJZZ	V	Worm Wheel Gear	AC					
37	NGERH1218AJZZ	V	Connect Gear	AC					
38	LHLDZ1931AJZZ	V	Loading Motor Block	AD					
40	MSLIP0006AJZZ	V	Shifter	AH					
41	MLEVF0419AJZZ	V	Shifter Drive Lever Ass'y	AG					
42	NGERH1219AJZZ	V	Take-Up Loading Gear	AD					
43	MLEVF0420AJZZ	V	Take-Up Loading Arm Ass'y	AG					
44	NGERH1220AJZZ	V	Supply Loading Gear	AC					
45	MLEVF0422AJZZ	V	Supply Loading Arm Ass'y	AG					

— End of Mechanism Chassis Parts —

Ref. No. Part No. ★ Description Code

CASSETTE HOUSING CONTROL PARTS

300	CHLDX3070TEV3	U	Cassette Housing Control Ass'y	
301	LHLDX1024AJ00	V	Frame (L)	AG
302	LHLDX1025AJ00	V	Frame (R)	AG
303	NGERR3003AJFW	V	Drive Angle	AE
304	NGERR1005AJZZ	V	Double Action Rack	AC
305	MSPRT0381AJFJ	V	Double Action Spring	AC
306	MSLIF0070AJFW	V	Slider	AH
307	LHLDX1026AJ00	V	Holder (L)	AD
308	MLEVP0246AJ00	V	Proof Lever (L)	AB
309	MSPRD0150AJFJ	V	Proof Lever (L) Spring	AB
310	LHLDX1027AJ00	V	Holder (R)	AD
311	MSPRP0159AJFJ	V	Cassette Spring	AD
312	MLEVF0424AJFW	V	Proof Lever (R)	AC
313	MSPRD0151AJFJ	V	Proof Lever (R) Spring	AB
314	NGERH1242AJ00	V	Drive Gear (L)	AD
316	NGERH1227AJ00	V	Drive Gear (R)	AD
317	MSPRD0153AJFJ	V	Drive Gear (R) Spring	AC
318	NGERH1228AJ00	V	Synchro Gear	AC
319	NSFTD0036AJFD	V	Main Shaft	AG
320	LANGF9581AJFW	V	Upper Plate	AH
321	MLEVP0247AJ00	V	Door Open Lever	AC
322	MLEVP0248AJ00	V	Sensor Lever	AB
323	MSPRT0382AJFJ	V	Sensor Lever Spring	AB
324	XHPSD30P06WS0	J	C3P+6S (for Cassette Housing Control)	AA

Ref. No. Part No. ★ Descript.

SCREWS, NUTS AND WASH

200	LX-XZ3030GEFD	J	Set Screw	
201	LX-BZ3095GEFD	J	Audio/Control Head Screw	
202	LX-BZ3096GEFD	J	Tilt Adjusting Screw	
203	XBPSD26P06000	J	Azimuth Adjusting Screw (2.6P+6S)	
204	XHPSD26P08WS0	J	Screw, C2.6P+8S (For FE Head)	
206	XBPSD30P05J00	J	Screw, SW3P+5S (For Loading Motor Block)	
207	XHPSD26P07WS0	J	Screw, C2.6P+7S (For Capstan Motor)	
208	XHPSD26P06WS0	J	Screw, C2.6P+6S (For Loading Motor Angle Ass'y)	AA
209	XHPSD30P08WS0	J	Screw, C3P+8S (For Drum Base)	AA
210	LX-NZ3046GEFW	J	X-Position Adjusting Nut	AB
211	LX-NZ3019GEZZ	J	Reverse Guide Adjusting Nut	AB
212	XNFSD40-31000	J	Audio/Control Head Adjusting Nut (M4)	AB
214	XWHJZ52-05110	J	Washer, W5.2P-11-0.5 (Reel Height Adj.)	AB
215	XWHJZ52-03110	J	Washer, W5.2P-11-0.3 (Reel Height Adj.)	AB
216	XWHJZ52-04110	J	Washer, W5.2P-11-0.4 (Reel Height Adj.)	AB
217	XWHJZ52-06110	J	Washer, W5.2P-11-0.6	AB
218	XWHJZ52-07110	J	Washer, W5.2P-11-0.7	AB
219	XWHJZ31-02070		Washer, W3.1-7-0.25	AA
220	LX-WZ1073GE00	J	Cut Washer, CW4.5P-10-0.5	AB
221	LX-WZ1006GE00	J	Cut Washer, CW2.6P-5.4-0.5	AA
222	LX-WZ1041GE00	J	Cut Washer, CW2.6P-6-0.5	AA
223	XRESJ40-06000	J	E-Ring, E-4	AA
229	XHPSD30P04WS0	J	Screw, C3P+4S (For Slow Brake Spring)	AA

— End of Cassette Housing Control Parts —

— End of Screws, Nuts And Washers —

Ref. No.	Part No.	★	Description	Code	Ref. No.	Part No.	★	Description	Code
MECHANICAL PARTS					FRONT PANEL PARTS				
601	CCABB1156TEV0	U	Main Frame Ass'y		501	CPNLC1979TEV0	U	Front Panel Ass'y (VC-M21HM)	
601-1	GCABB1156UMZZ	U	Main Frame		501	CPNLC1980TEV0	U	Front Panel Ass'y (VC-M41HM)	
601-2	PFLT-0016AJZZ	V	Foot Felt	AB	501-1	HPNLC1979UMSA	U	Front Panel (VC-M21HM)	
602	GCOVA1907UMZZ	U	Antenna Terminal Cover		501-1	HPNLC1980UMSA	U	Front Panel (VC-M41HM)	
603	GCABA3098UMS3	U	Top Cabinet		501-2	HBDGB1008AJSA	V	Badge, "SHARP"	AE
604	GBDYU3095UMZZ	U	Bottom Plate		501-3	HDECQ1327UMSA	U	Cassette Flap (VC-M21HM)	
605	LANGQ9059UMFW	U	Top Cabinet Fixing Angle (R)		501-3	HDECQ1316UMSA	U	Cassette Flap (VC-M41HM)	
606	LANGQ9062UMFW	U	Top Cabinet Fixing Angle (L)		501-4	HDECQ1279UMSA	U	Front Decoration Window (VC-M21HM)	
607	PSLDM4499UMFW	U	H/A Shield		501-4	HDECQ1337UMSA	U	Front Decoration Window (VC-M41HM)	
608	PSPAZ0477UMZZ	U	Spacer		501-5	JBTN-2638UMSA	U	Button, Operate (VC-M21HM)	
609	XJPSD30P10WS0	V	Screw	AA	501-5	JBTN-2645UMSA	U	Button, Operate (VC-M41HM)	
610	XEBSD30P12000	V	Screw	AA	501-6	JBTN-2639UMSA	U	Button, Channel/REC (VC-M21HM)	
611	XEBSD40P12000	V	Screw	AA	501-6	JBTN-2646UMSA	U	Button, Channel/REC (VC-M41HM)	
612	XESSF30P12000	V	Screw	AA	501-7	JBTN-2640UMSA	U	Button, Channel Set (VC-M21HM)	
613	XHPSD30P06WS0	V	Screw	AA	501-7	JBTN-2647UMSA	U	Button, Channel Set (VC-M41HM)	
614	LX-HZ3030GEFF	J	Screw	AA	501-8	MSPRD0103AJFJ	V	Cassette Spring	AB
615	PSPAZ0390AJZZ	V	Spacer	AC	502	JKNBK1086UMSA	U	Dial (VC-M21HM)	
616	XBPSD30P06000	V	Screw	AA	502	JKNBK1086UMSI	U	Dial (VC-M41HM)	
617	LHLDZ1927UMZZ	U	Terminal PWB Holder		503	CBTN-2642TEV1	U	Button Ass'y	
618	PSPAZ0518UMZZ	U	Spacer		503-1	JBTN-2643UMSA	U	Button, Stop/Eject	
					503-2	JBTN-2650UMSA	U	Button, Pause/Still	
					503-3	LHLDZ1929UMZZ	U	Button Holder	
					503-4	MSPRC0195AJFJ	V	Spring	AB
					503-5	JBTN-2642UMSH	U	Button, Play	

— End of Mechanical Parts —

— End of Front Panel Parts —

Ref. No.	Part No.	★	Description	Code
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Ref. No.	Part No.	★	Description	Code
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SUPPLIED ACCESSORIES

ACCESORIES

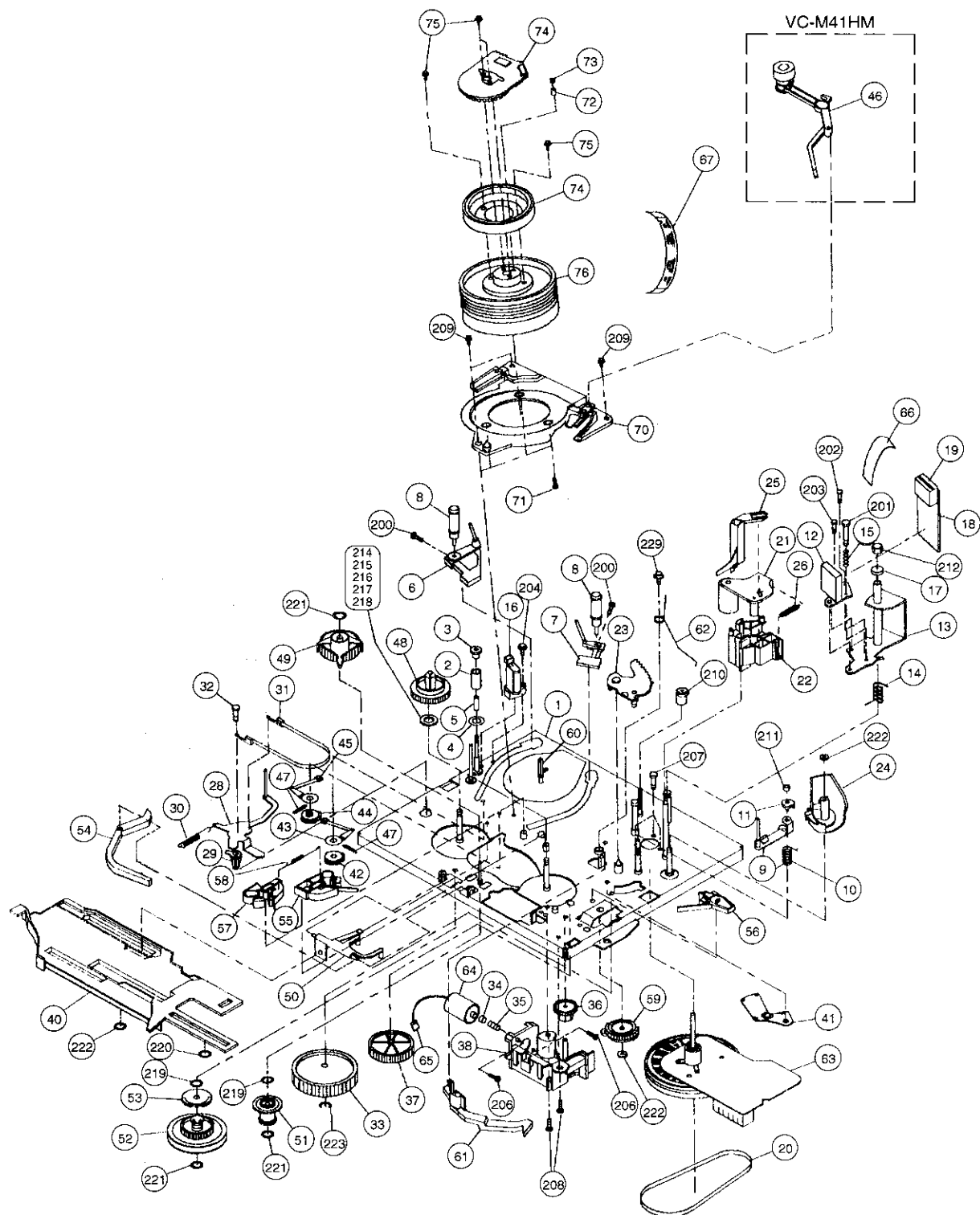
QCNW-7544UMZZ	U	75ohm Coaxial Cable	AM
RRMCG0076AJSA	V	Infrared Remote Control Unit	AX
GCOVH0042LASA	V	Battery Cover, Infrared Remote Control Unit	AF

ACCESORIES (NOT REPLACEMENT ITEM)

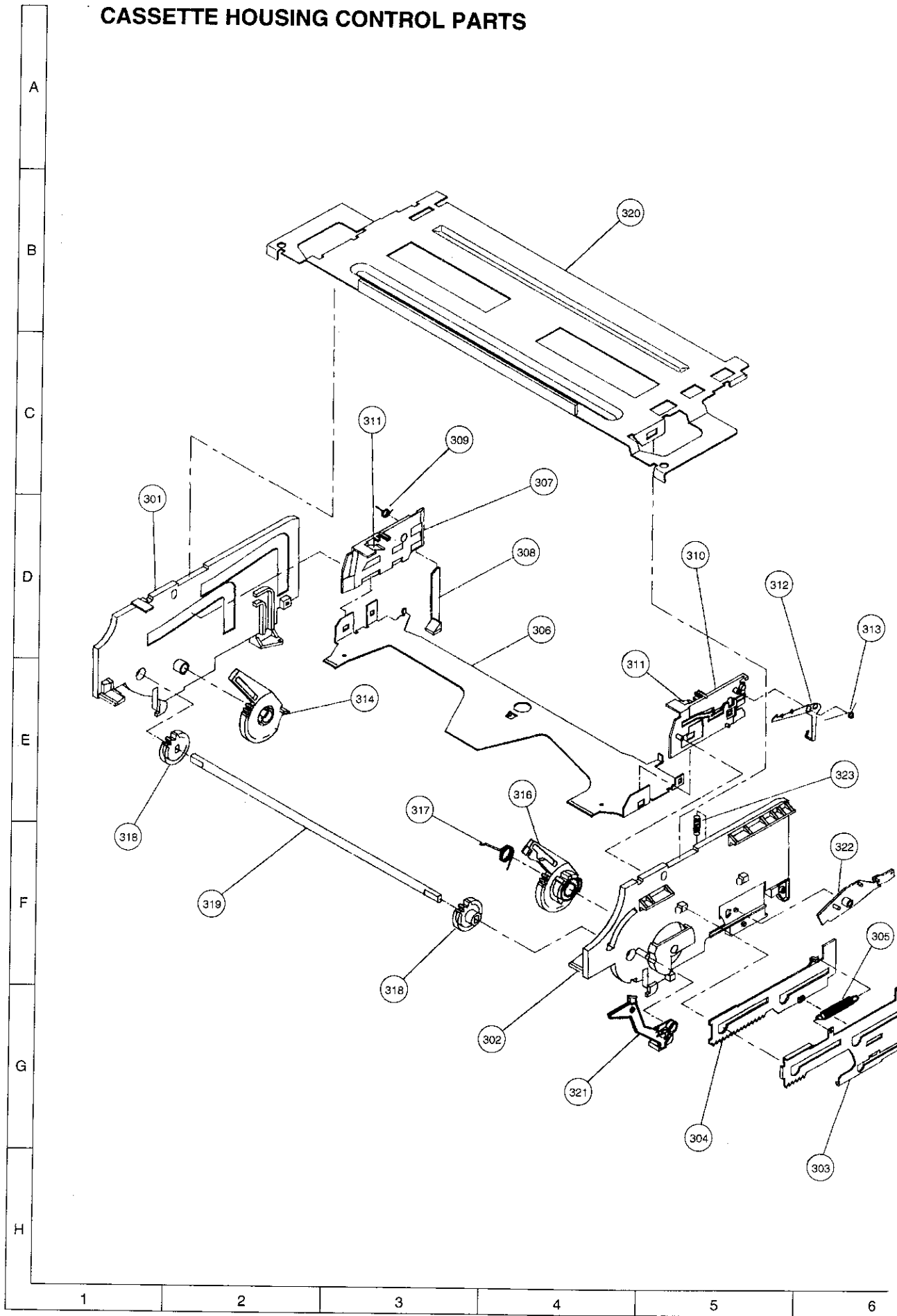
TGAN-3135UMZZ	-	Guarantee Card	—
TINS-2575UMZZ	-	Operation Manual (VC-M21HM)	—
TINS-2576UMZZ	-	Operation Manual (VC-M41HM)	—
TINS-2606UMZZ	-	Quick Set-up Guide	—

— End of Supplied Accessories —

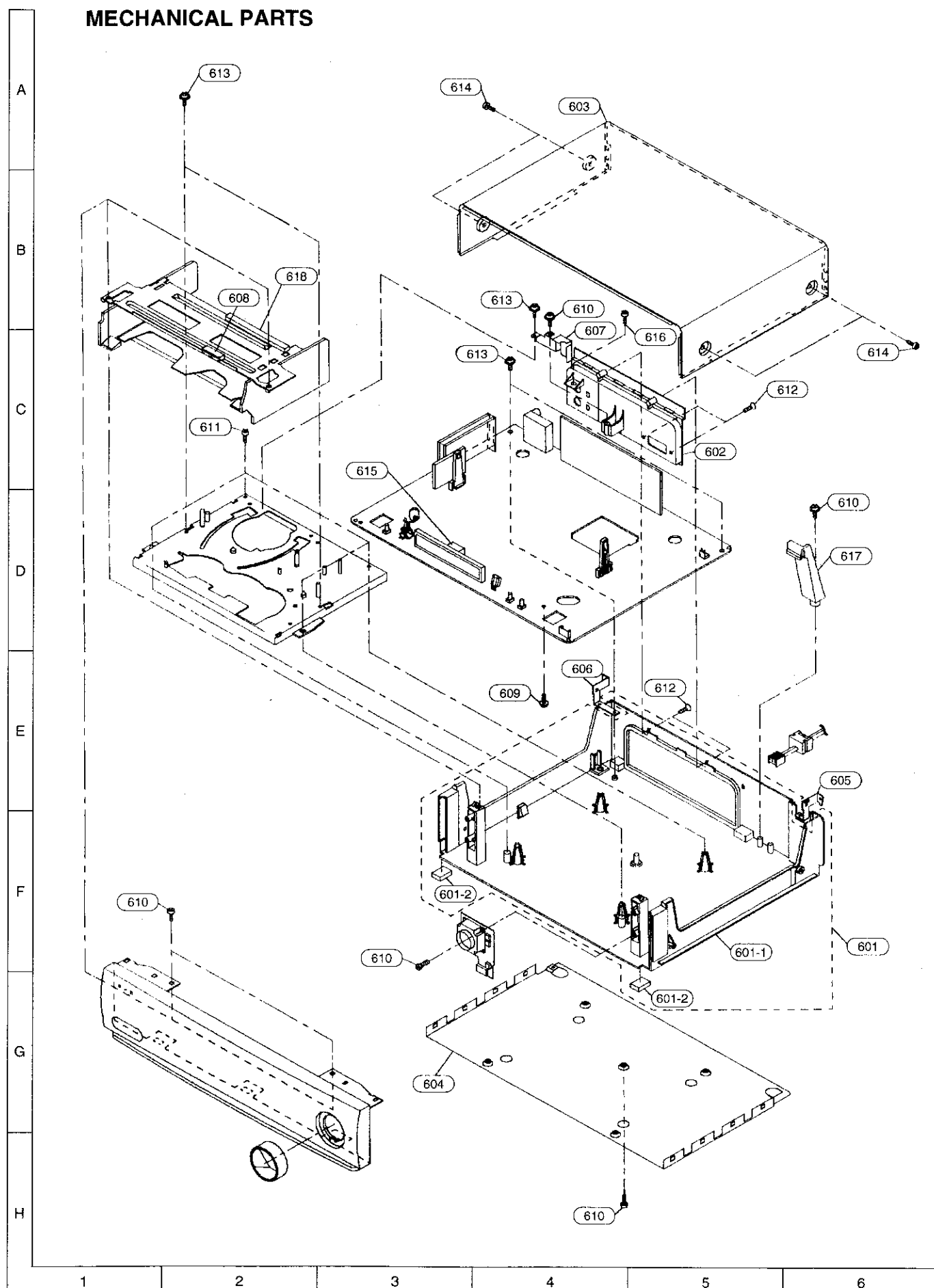
11. EXPLODED VIEWS MECHANISM CHASSIS PARTS



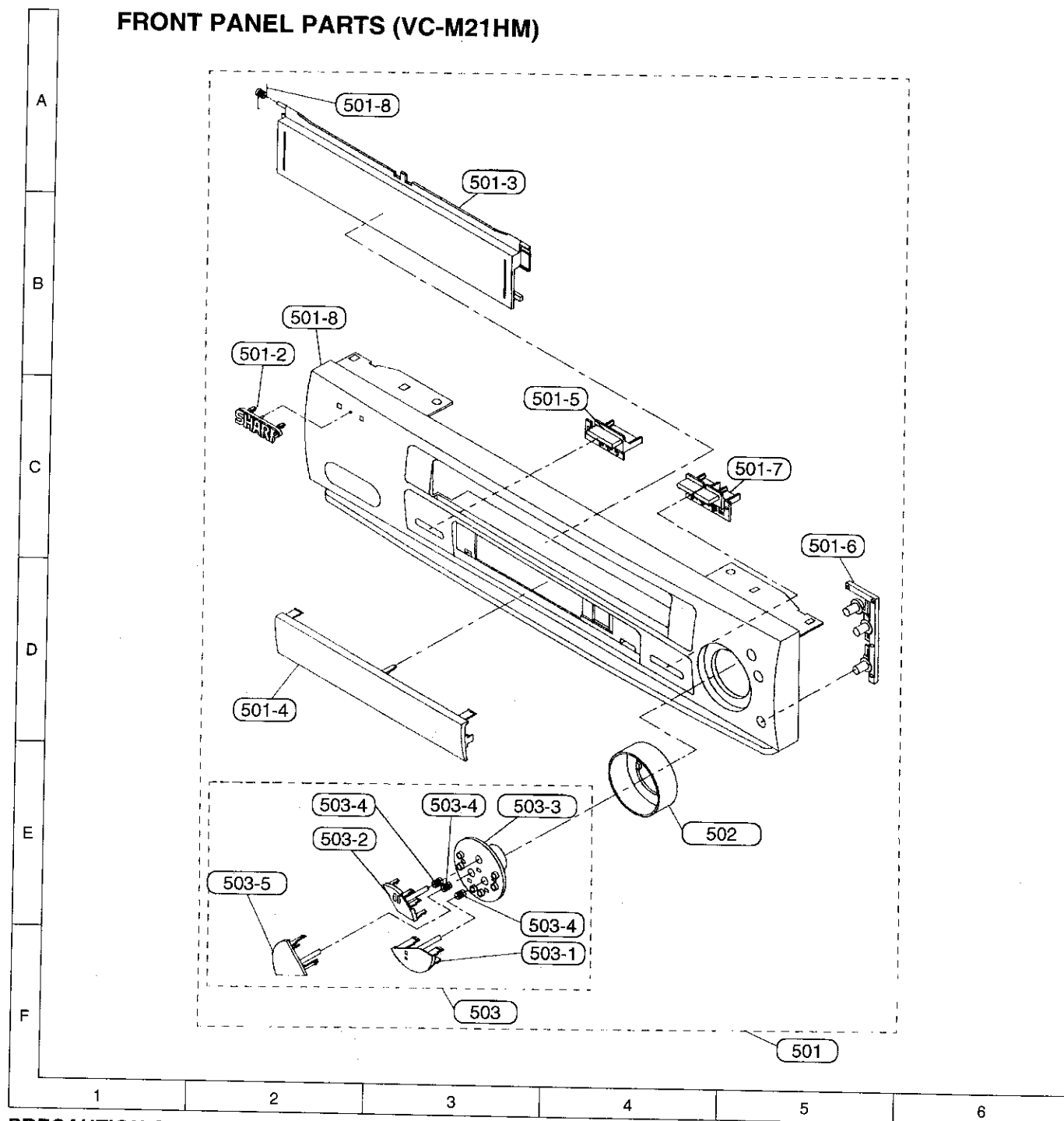
CASSETTE HOUSING CONTROL PARTS



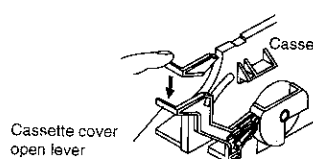
MECHANICAL PARTS



FRONT PANEL PARTS (VC-M21HM)

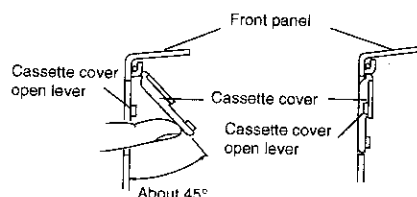


PRECAUTION ON FRONT PANEL SET-UP



Cassette cover open lever

Before attaching the front panel in position, make sure that the cassette cover open lever is in its right place (lower-most). If it is out of position, push it down with a finger.

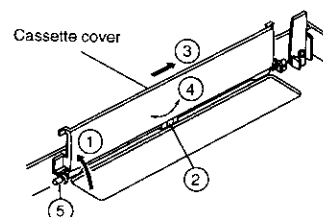


Cassette cover open lever

About 45°

Keep the cassette cover about 45° open and make sure that the cassette cover open lever is between the front panel and the cassette cover. Now fix the front panel in place.

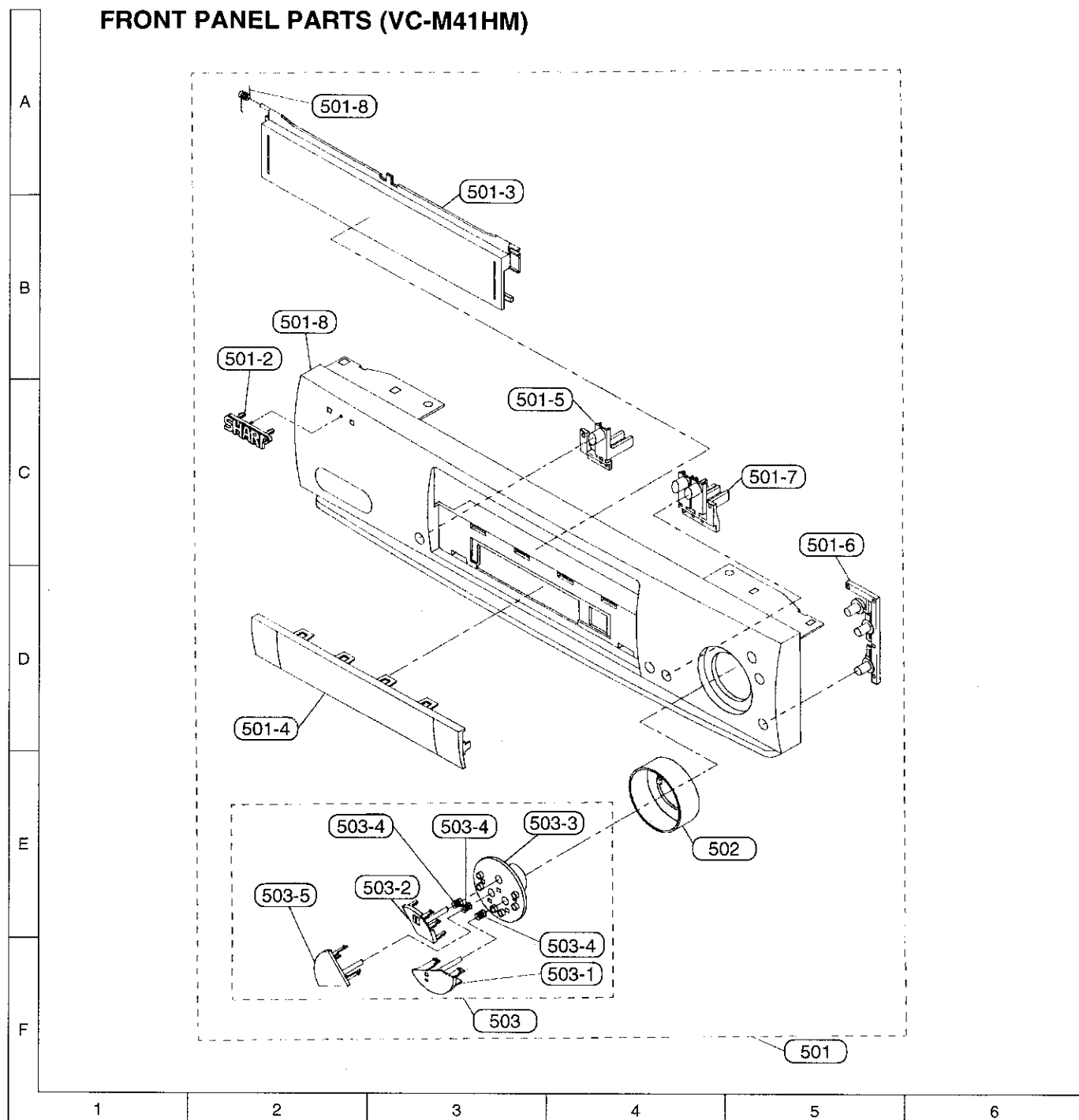
Do not mount the front panel with the cassette cover tilted too open. Otherwise the cassette cover might wrongly run on the cassette housing.



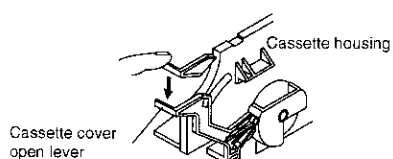
Cassette cover

Removing the cassette compartment cover.
① Open the cassette compartment cover fully.
② Remove the center positioner.
③ Slide the cover to the right.
④ Slightly bend the cover.
⑤ Draw out the left-side rod.

FRONT PANEL PARTS (VC-M41HM)

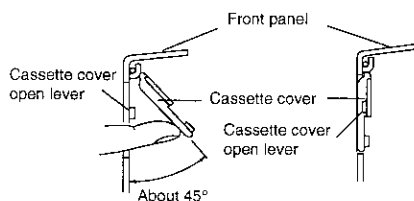


PRECAUTION ON FRONT PANEL SET-UP



Cassette cover
open lever

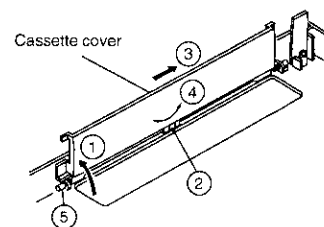
Before attaching the front panel in position, make sure that the cassette cover open lever is in its right place (lower-most). If it is out of position, push it down with a finger.



About 45°

Keep the cassette cover about 45° open and make sure that the cassette cover open lever is between the front panel and the cassette cover. Now fix the front panel in place.

Do not mount the front panel with the cassette cover tilted too open. Otherwise the cassette cover might wrongly run on the cassette hous-



Cassette cover

ing.
Removing the cassette compartment cover.
① Open the cassette compartment cover fully.
② Remove the center positioner.
③ Slide the cover to the right.
④ Slightly bend the cover.
⑤ Draw out the left-side rod.

12. PACKING OF THE SET

■ Setting position of the Knobs

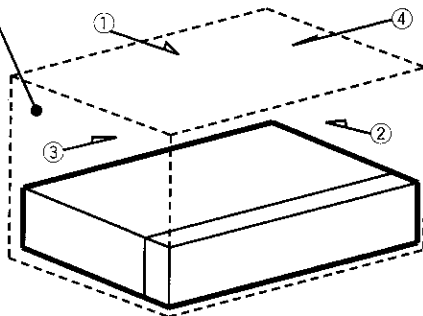
RF conv. CH. preset	at "E36" channel	Test Signal	at "OFF" position
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Accessories

- ★ TINS-2575UMZZ (VC-M21HM) Operation Manual
- ★ TINS-2576UMZZ (VC-M41HM) Operation Manual
- ★ TGAN-3135UMZZ Guarantee Card
- ★ TINS-2606UMZZ Quick Set-up Guide Card
- ★ QCNW-7544UMZZ 75 ohm Coaxial Cable Battery

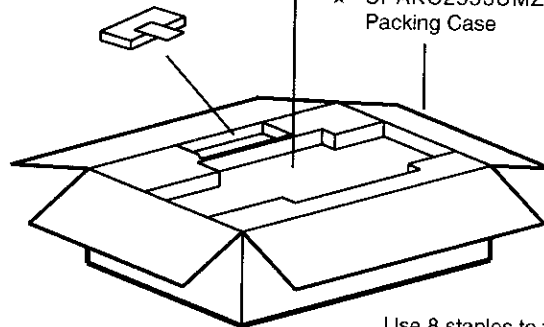
★ SPAKA0003UMZZ
Polystyrene Sack

★ SPAKP0051UMZZ
Polystyrene Sack



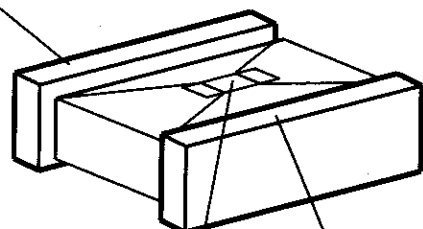
RRMCG0076AJSA
Infrared Remote
Control Unit

★ SPAKC2553UMZZ
Packing Case



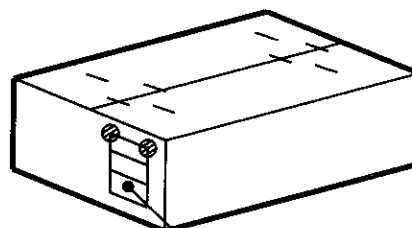
Use 8 staples to fix the bottom
of packing case

★ SPAKX0874UMZZ
Buffer Material (Rear)



Fix with craft tape

★ SPAKX0875UMZZ
Buffer Material (FRONT)



★ TLABK0001UMZZ
No Card

MARK ★ Not Replacement Item

T1072-S
Printed in Japan